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THE ADMINISTRATION OF SALVARSAN IN SYPHILIS *

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Before the introduction of the Wassermann reaction the treatment of syphilis was more or less a matter of guess-work. While it is doubtless true that some patients were cured by the methods then in vogue, and others possibly treated for too long a period, the observations which I have made during the past three years show that the majority of such patients still retained their infection. The idea which prevailed among physicians and is still prevalent among the laity, that one attack of syphilis confers immunity, is chiefly if not entirely due to the fact that syphilis was seldom cured under the old methods of treatment. It is impossible to give the average percentage of cures formerly obtained, but from my findings and the application of the Wassermann test to cases treated five to twenty-five years ago I should say not more than 20 to 25 per cent.

The great rarity of a second infection in these patients supports the contention that cures were then infrequent. Since the beginning of the salvarsan era reinfection is being reported with growing frequency, and, as recent laboratory and clinical studies tend to show that immunity in syphilis does not exist, except perhaps in certain cases covered by Profeta's law, the number may be expected to multiply. The failure, then, to develop a second attack is not due to true immunity, but to an insusceptibility because the disease is still present. This insusceptibility or anergy is said to develop soon after generalization of the infection and lasts until it is cured spontaneously or by specific remedies.

Cases of reinfection after a cure had been established with salvarsan alone or in combination with mercury have been reported by various continental observers, and I mention Gennerich particularly, as he employed the more intensive combination-therapy from the beginning and controls his cases by means of provocative treatment, or the biologic reactivation of the Wassermann reaction. Both Gennerich and Milian found that by injecting patients with 0.3 gm. of the remedy six months or a year after a supposed cure and by examining their blood every day thereafter for two weeks a transient positive reaction was procurable if any evidence of the infection was left, while it remained negative if cure was absolute.

In my own experience I have met a case of possible reinfection giving the following history:

CASE 1.—A. B., aged 30, developed a primary lesion Dec. 9, 1910; Wassermann was double plus, Dec. 30, 1910; Jan. 1, 1911, 0.5 gm. salvarsan was given intravenously; Feb. 17, 1911, Wassermann was weakly positive. About the middle of March, ten days after exposure, patient developed an induration like the original chancre on the opposite side of the glans penis. Spirochetes were found in the lesion. On April 15 the Wassermann reaction was strongly positive; April 17 and 24 patient received 0.52 gm. The serum reaction May 6 was plus minus, July 14 negative and has remained negative. Neither instance was followed by a generalized rash.

The treatment of syphilis is no longer the control of symptoms, but should be undertaken with a full appreciation of the serious nature of the infection. Furthermore, it should be undertaken with a thorough understanding of what is to be accomplished with the remedies employed. The amount of treatment in lues cannot be arbitrarily fixed, as the infection varies within wide limits in different individuals. In some its course is so mild that it is possible to eradicate it with a minimum amount of the drugs, while in others — and they are in the majority—it persists with treatment increased many fold.

The perfunctory administration of protoiodid pills, a practice only too much in vogue, accomplishes little in the eradication of the disease and leads to an immunity to the drug. Day after day we see patients, the victims of paresis, tabes or other serious disease, all giving an identical therapeutic history, namely, two, three or more years of pill-taking. The method stands condemned by its eloquent results.

If practitioners follow the rules of treatment laid down in certain modern text-books on therapeutics, one as recent as 1911, the number of cures will certainly not increase. On the contrary the late manifestations will continue to show as large a percentage as in the past. It is time a campaign of education is instituted as to the proper administration of our standard drugs in the treatment of syphilis. When a physician who pretends to be an instructor of students states that the treatment of syphilis by mercury given internally is still the method of choice, it is, to say the least, far from the truth. In the light of the results shown by the Wassermann reaction, as I have reiterated time and again, few patients treated in this manner are actually cured by the drugs employed; on the contrary, an increasing immunity to mercury is produced so that its subsequent administration is absolutely without effect except to impair the nutrition of the patient. I have repeatedly seen cases of obstinate syphilitic infection of the skin, as scaling syphilids of the palm, treated for years internally with-

* Because of lack of space this article is somewhat abbreviated in THE JOURNAL. It appears in full in the Transactions of the Section and in the author's reprints.

* Read before the joint meeting of the Section on Dermatology and the Section on Pathology and Physiology of the American Medical Association at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

out any effect, yield after four or five injections of salicylate of mercury. It is not sufficient to know that mercury influences the syphilitic lesions, but one should be familiar with the methods of administration which influence the disease in the most rapid and permanent manner and this certainly cannot be said of mercury by the mouth. It is true that when it is administered in large doses combined with potassium iodid, the so-called mixed treatment, it is efficacious in many of the late cutaneous manifestations, but I have seen few cases in which even a persistent use of the remedies given in this way would permanently change the serum reaction.

The efficiency of the modern treatment of lues is attested by hundreds of experienced observers all over the world. It is now known that criticism of the specific action of salvarsan when given in single doses is of no value nor are the conclusions based on imperfect methods of preparation and administration. Since its introduction several modifications in the technic have taken place. Subcutaneous and intramuscular injections have entirely given way to the intravenous method, although, as I have observed previously, the intramuscular injection of an alkaline solution was the more efficacious of the two. This statement is borne out by the results obtained in some of the early patients treated, several of whom I have been able to keep under observation to the present time.

Salvarsan is a specific spirochetal poison the efficiency of which is in direct ratio to the age of the infection. One of its most pronounced points of superiority over mercury, in my estimation, lies in the treatment of the early cases in which in the primary stage it is possible to prevent the development of secondary symptoms and a positive Wassermann, or, in the event of its being already positive, to change it to negative. In the old days it was the rule for the practitioner to await the development of secondary symptoms to corroborate his diagnosis or to justify various superstitions such as proneness to nerve syphilis or an inhibition of antibody formation, if treatment were instituted in the early period of the disease. The latter had a certain amount of support from pathologists who believed that the natural defenses of the body would rally to the fore more quickly and strongly if the combat were not interfered with by drugs. Such views have long since been discredited and it has been proved that the best interest of the patient is served by the earliest possible treatment. With laboratory aids, such as the dark-field microscope and the Wassermann reaction, a diagnosis need not long remain in doubt. Of the significance of antibodies in syphilis, Thalmann's view is perhaps the prevalent one, namely, that early in the disease, especially after the destruction of the spirochetes by treatment and the liberation of their endotoxins, there is corresponding formation of antibodies and with it an increase in immunity. This antibody production may be so considerable that even without further treatment an arrest and improvement of the disease may result. As the living spirochetes gradually continue to proliferate, immunity decreases, and later when the foci are smaller in number they contain weaker spirochetes and few antibodies. According to this author, the endotoxins have so weakened the tissue cells that in tertiary syphilis only slight amounts of the virus are sufficient to cause a destruction of tissue and ulcerative processes. Wolff-Eisner,[2] however, attributes the severe clinical alterations to a hypersensitiveness brought about by the repeated absorption of heterogenous albumin.

It cannot be too strongly emphasized that in the treatment of the various stages of the disease different problems confront us. In the early period it may be possible with one or two or three doses of salvarsan, alone or in combination with mercury, completely to sterilize the patient and eradicate the infection. This has been demonstrated in my experience in the following cases:

CASE 4.—Patient (S), who had three initial lesions of the lips, and secondary eruption, was treated May 19, 1910, with 0.3 gm. alkaline solution intramuscularly. Prior to this treatment he had had two intramuscular injections of hydrarg. salicylate. Since then he has had no other treatment; no clinical signs of the disease; his Wassermann reaction was negative Oct. 23, 1910, and the last one made March 15, 1912, was likewise negative.

CASE 5.—The patient (C) had a chancre Oct. 12, 1910. Treatment was given Nov. 17, 1910, 0.55 gm. alkaline solution; Dec. 23, 1910, 0.6 gm. alkaline solution. The serum reaction, strongly positive before the first treatment, was only weakly so before the second and became negative on March 30, 1911. Repeated examinations made to Feb. 17, 1912, have all been negative. This patient never developed secondaries.

CASE 6.—The patient (P) developed a primary lesion Feb. 10, 1911; Feb. 25, 1911, he received 0.6 gm. salvarsan intravenously. The Wassermann reaction was negative at the time of treatment and continued so with no further development of symptoms.

CASE 7.—The patient (B) had an initial lesion Dec. 9, 1910; received treatment Jan. 1, 1911, April 17, 1911, and April 28, 1911, 0.5 gm. each. Reaction, negative in July, has remained so since.

CASE 8.—The patient (B) developed a primary lesion Sept. 21, 1910. On Oct. 24, 1910, he received 0.6 gm. salvarsan in alkaline solution. Reaction was negative March 11, 1911.

CASE 9.—The patient (S) had a primary lesion September, 1910, with beginning secondaries. He received treatment Dec. 27, 1910, 0.6 gm. alkaline solution followed by a course of inunctions. Reaction was negative January, 1911, and is still negative.

CASE 10.—The patient (N) had two initial lesions on hand November, 1910. No. 28, 1910, he received 0.6 gm. alkaline solution. Reaction has been negative since March, 1911.

CASE 11.—The patient (W) had an initial lesion Dec. 1, 1910, began treatment Dec. 30, 1910, 0.6 gm. alkaline solution followed by mercurial injections. March 17, 1911, he received 0.55 gm. salvarsan intravenously, followed by mercurial injections. The Wassermann reaction has been negative from June 12, 1911, to the present.

CASE 12.—The patient (E) had a tonsillar lesion Jan. 1, 1911. On Feb. 21, 1911, he received 0.5 gm. salvarsan intravenously, and on March 10, 1911, 0.4 gm. intravenously, followed by mercurial treatment. The Wassermann became negative March 29, 1911, and has continued so.

CASE 13.—The patient (D) had a chancre in March, 1911; he was treated March 10 and April 7, 1911, receiving 0.5 gm. salvarsan each dose intravenously, followed by two courses of mercurial injections. He never developed any secondaries and his Wassermann reaction is negative.

CASE 14.—The patient (B) had a primary lesion in July 1911; received treatment Aug. 22, 1911, 0.58 gm., followed by mercurial injections; and Oct. 2, 1911, and Nov. 18, 1911, 0.5 gm. each. His reaction is now negative.

CASE 15.—The patient (M) was infected Aug. 16, 1911. At the time of treatment he had an indurated lesion containing numerous spirochetes; reaction was positive. Sept. 2, 1911, he received an intravenous injection of 0.58 gm., followed by a course of inunctions. No other manifestations developed and the reaction Nov. 23, 1911, and Feb. 11, 1912, was negative.

2. Wolff-Eisner: Clinical Immunity, 1911.

While it is demonstrated that it is possible to cure syphilis within six months with two to four doses of salvarsan alone or with mercury, it will not do to rely too confidently on accomplishing this result; in patients in whom a negative reaction has been obtained, I insist on serologic observations for at least a year after the first negative reaction has been obtained, and when practicable I advise a provocative injection of salvarsan.

Excision of the initial lesion is advocated by a number of modern syphilographers as an aid in ridding the patient of a focus of spirochetes, but as yet we have not accumulated sufficient evidence to show whether the infection in patients thus treated pursues a milder course or not. In former years there were many claims made as to the possibility of aborting syphilis by excising the initial lesion and communicating lymph-nodes, but after many trials the procedure was abandoned, as it was definitely shown that the disease in such patients followed the same course as in those who had not undergone excision. If all of the spirochetes were concentrated in the initial lesion, it would be an entirely rational procedure to excise it and remove the focus at once; it is known that this is not the case, but that early generalization takes place through the lymphatic system and the blood, and that at best we are only ridding the patient of a small nest of spirochetes. When the chancre is situated on the foreskin or an easily accessible region, however, there is certainly no objection to excising it.

During the secondary period of the disease with a strong, positive Wassermann reaction the infection is more difficult to eradicate in a short time, but it is possible even then by more intensive treatment — let us say, five or six doses of salvarsan at intervals of from one to four weeks, followed by a course of mercurial injections or inunctions. That it is possible to cure the disease in from six months to a year in this stage I have demonstrated by cases which have been under observation for from eighteen months to two years. As the disease grows older, the time required for its eradication grows progressively longer, as in cases in which the infection dates back, five, twenty or thirty years. In these it may require ten or twelve injections of salvarsan combined with several courses of mercurial injection to reverse the serum reaction permanently, but, if we pursue our treatment with a definite plan and have confidence in our drugs, persistent treatment, extending over a period of a year, will change the reaction. The question is sometimes rendered more difficult by the failure of patients to cooperate with the physician in their treatment. Usually, however, when the problem is placed before intelligent patients in a clear and definite manner, their cooperation can be secured and, when this is so, salvarsan, supplemented by mercury, will in the majority of cases change the reaction. It may be that there is a certain class of cases in which no amount of treatment will reverse the reaction.

Salvarsan has a much more rapid action on the organism than mercury. This is demonstrated most strikingly in cases with mucous membrane lesions and in those of malignant syphilis. In the latter the extreme cachexia, which characterizes this type of the disease, disappears within two or three weeks, and lesions which have persisted for months promptly recede. It is a common experience to see patients whose cases were absolutely hopeless under the old method restored to health in a few weeks.

CASE 16.—I recall a patient seen a year and a half ago, in a state of extreme physical and mental depression, with ulcerative lesions, joint involvement and a nephritis. His lesions yielded in a surprising manner; at the end of a month his weight had increased from 105 to 121 pounds and under continued treatment he became entirely well. He has now had no drugs for a year, weighs 145 pounds and has had a continuous negative reaction.

CASE 17.—In another case in which the patient was cachectic, had been running a high temperature for a year, had multiple cutaneous lesions and a specific orchitis, all symptoms resolved under two doses of salvarsan and the patient's physician writes me that his nutrition and strength improved to such an extent that for months he has been able to do hard work in a lumber camp, whereas he had been an invalid for nearly a year and a half before treatment. This patient had a decided idiosyncrasy against both mercury and potassium iodid, the latter producing edema of the tongue. His Wassermann reaction, made a few weeks ago, was still strongly positive, as might be expected with only two doses of the drug at his stage of the disease.

In controlling the treatment by the Wassermann reaction it must be borne in mind that from 10 to 15 per cent. of the active late manifestations of syphilis give a negative reaction, so that, in the face of positive clinical findings and a negative test, the latter may be disregarded in the late stages of the disease. I have on several occasions administered salvarsan to patients with a negative Wassermann with the very best results. In the case of a physician with a marked onychia involving the nails of his hands and feet, a decided change took place after the second injection. The nails, which had been thickened, discolored, fissured and every now and then shed and replaced by the same deformity of these structures, were after the treatment reproduced in an absolutely normal manner. The explanation of a negative reaction in the presence of clinical symptoms is based on the fact that the spirochetes are too few in number to give rise to the Wassermann-producing substances.

In disease of the nervous system the administration of salvarsan should be undertaken only with the full knowledge of the possible effects. That great prudence must be exercised was taught by the accidents which occurred in cases with advanced disease of the nervous system during the trial period of the drug. Professor Ehrlich is of the opinion that the former dreaded reactions in late lues of the nervous system are to be referred entirely to faulty technic and the use of old water containing the proteid products of dead organisms. In a letter recently received he states that Dreyfuss of Frankfort has treated hundreds of cases of late nerve syphilis without any reaction whatsoever, except in a single instance in which a spinal puncture had been made just prior to the salvarsan injection. In this patient the puncture was regularly followed by meningeal manifestations lasting several days. When the injection was delayed until such symptoms had subsided, absolutely no by-effects were noted. In syphilis of the brain the possibility of the development of the Herxheimer reaction should always be kept in mind. Although we have no pathologic findings in such cases, the occurrence of convulsions and localized paralyses after the administration of the drug points to an intensification of the inflammatory process about certain focal brain lesions, which in the majority of cases is only transient. Where the remedy is indicated, it should be given cautiously in small repeated doses or preceded by several injections of mercury. In this way a gradual effect on the lesion is produced and we avoid a too rapid disso-

lution with dangerous consequences. Even with a positive Wassermann reaction and an active process, when combined with degenerative changes in the brain cord, its administration is rather a delicate question to determine.

It is, however, indicated in tabes with a very positive serum reaction and a lymphocytosis of the cerebrospinal fluid. In these cases its administration in repeated small doses at proper intervals offers more than the treatment with mercury and potassium iodid. But to be satisfied with one or two injections is not giving the patient the full benefit of all that may be accomplished. It relieves the pains, increases the efficiency of the bladder function and stimulates the body nutrition. In several patients with inequality of pupils the latter have become equal and in two cases in which they were unresponsive to light the reflex returned. In the old degenerative types with a negative reaction and absence of lymphocytosis, the active specific process is probably entirely replaced by degenerative and sclerotic changes, and the administration of salvarsan or any other remedy can accomplish little or nothing.

The most marked improvement is seen in cases of cerebrospinal syphilis which simulate tabes.

CASE 18.—I have under observation a patient who had had a hemiplegia and epileptiform convulsions. His knee-jerk was absent on the right side, locomotion was impaired, his pupils were unequal and sluggish to light and he suffered from incontinence of urine. These symptoms have all practically disappeared. He has regained control of his bladder, his pupils are equal and responsive and he walks now a distance of several miles with little fatigue. His blood reaction has been persistently negative for six months.

In the treatment of paresis my experience has been limited to only a few cases.

CASE 19.—In one with a very positive Wassermann reaction the administration of three doses was followed by a marked remission in all of the symptoms. The reaction remained positive and I strongly urged the family of the patient to continue the treatment. The advice went unheeded and within a month or two the patient's symptoms reappeared and progressed in a rapid manner.

CASE 20.—At present there is under my care a patient who came to me with the diagnosis of paresis from one of the best-known neurologists in New York. He had marked delusions of grandeur; his pupils were unequal and sluggish to light, and his knee-jerks were absent. There was no speech disturbance and no change in his handwriting. His serum reaction was strongly positive. Up to this time he has had seven injections at intervals of from three to four weeks. His delusions have entirely disappeared, his pupils are practically equal and more responsive to light and in every way he acts like a normal individual. His reaction is still strongly positive and guided by this index I am advising persistence in treatment. In addition to his salvarsan injections he has had several courses of mercurial inunctions. He was lately seen by the consulting neurologist, who was inclined to change his diagnosis of paresis on account of the improvement that had taken place.

All neurologists have emphasized the difficulty of differentiating between the early stages of paresis and other forms of cerebral lues which simulate paresis. Reports of autopsy findings in these two classes of cases are perhaps too meager to enable us to draw deductions as to whether any essential differences exist between the two, other than the cerebrospinal cell count. It has long been held by Dr. Dana that the prognosis in early paresis is not wholly hopeless, as many of these forms develop from a preexisting cerebrospinal syphilis which can be arrested by treatment.

Regarding the permanency of results in nerve syphilis I might refer to a case reported a year and a half ago.

CASE 21.—The patient was suffering from an obliterating endarteritis of the base of the brain involving both pyramidal tracts and the sympathetic. His pupils were unequal, very nearly Argyll Robertson, and his speech was thick. There was general involvement of the muscles of the pharynx, tongue and face on the right side with anesthesia, partial paralysis of the right leg, marked Babinski, clonus of both knee and ankle and incontinence of urine. The Wassermann reaction was positive. A decided improvement took place after the first two injections. The treatment was carefully controlled by repeated Wassermann tests and when the strength of the reaction increased, the patient was immediately given another injection. This method of procedure has been kept up to the present time and the man may be considered practically well, with only slight evidence of his former hemiplegia. He has been able to resume his professional duties, which he conducts as well as formerly.

Intense headaches, often so persistent during the secondary and tertiary stage of the disease and due to a low-grade meningitis, are influenced by salvarsan in a most gratifying manner. They usually remit with remarkable rapidity, patients stating that within from twenty-four to forty-eight hours or a few days after the injection the pains have entirely disappeared. Occasionally they are intensified for two or three weeks after treatment and then suddenly disappear.

The drug has been criticized owing to the relapses which have occurred, affecting chiefly the nervous system, and which the critics attributed to a toxic action and a special affinity for nervous tissue. That this view was not justifiable is shown by the experience of the past year, for since the adoption of more intensive treatment such reports have become comparatively rare. The reasonable deduction therefore is that these complications were true relapses, as has been proved by further observation of the cases and in some instances by examination of the cerebrospinal fluid.

The latest word on salvarsan concerns the new product neosalvarsan. This preparation, which bears the laboratory number 914, is a very soluble form of salvarsan obtained by the addition of formaldehydsulphoxylate of soda. It is claimed to be fully as efficacious as the old remedy and possesses certain decided advantages in the simplification of the technic of its preparation and the greater tolerance to it, permitting much larger doses at shorter intervals, thus concentrating the attack on the disease. Neosalvarsan is extremely soluble in water. Neutralization with caustic soda is not necessary as with old salvarsan, as the new product is neutral when in solution. It is prepared by dissolving 0.15 gm. in 20 c.c., or 1.5 gm. in 200 c.c. of freshly distilled water; 0.8 gm. in 22 c.c. gives an isotonic solution. Schreiber, who has been entrusted with the preliminary trials and has given over 1,200 injections since last October, advises that the temperature of the water be about 20 C. (68 F.). As the preparation oxidizes readily and the oxidation products are more toxic than the drug itself, the following precautions are suggested: In making the mixture it should be gently agitated and not vigorously shaken. It should not be warmed after it is made up, and it must be used immediately.

Four doses are administered in succession with an interval of one day between. Schreiber's procedure is to give 0.9 gm. for the first dose, 1.2 gm. for the second, 1.35 gm. on the third day and 1.5 gm. on the fourth. This equals 6 gm. of neosalvarsan or 4 gm. of salvarsan

within one week. Women receive from 0.75 to 1.2 gm., children 0.15 to 0.35 and infants 0.05 gm.

In cases of meningitis or involvement of the cerebrospinal system the patient's susceptibility should be cautiously tested with small doses. Owing to its less irritating properties neosalvarsan lends itself more readily to intramuscular use. For this purpose 0.9 gm. are dissolved in about 30 c.c. of water. Several c.c. of a 1 per cent. novocain solution are first injected; the needle is left *in situ*, and the neosalvarsan injected through it several minutes after. Schreiber[4] has observed edema after its use, but never infiltration or necrosis. He prefers, however, the intravenous method.

Two weeks after treatment the Wassermann reaction is to be taken and, if negative, is to be repeated at monthly intervals. If it becomes positive, an intensive course of mercury is to be inaugurated followed by two more injections of neosalvarsan. If it still is positive two weeks after the first series of injections, the above plan is to be put into immediate effect.

Through the kindness of Professor Ehrlich I received a supply of neosalvarsan and have used it in about thirty cases, including early and late manifestations. The data relative to these cases will be published in a subsequent article, as the time which has elapsed since the administration of the remedy is now too short to permit of a definite expression of opinion.

In all the patients except one the clinical symptoms were influenced very promptly. In the exception, a gummatous ulcer of the leg, the lesion remained unaffected two weeks after the fourth injection, but yielded readily to mixed treatment. In none of the cases with a strong Wassermann was the reaction reversed at the end of two weeks. An initial lesion of the lip with secondaries completely resolved in three weeks with a negative Wassermann. A case of early syphilis with a marked iritis and chorioiditis, after 5 gm. of neosalvarsan were given in one week, gave a negative Wassermann after two weeks of mercury. In three other cases the Wassermann reaction has become progressively weaker in from four to six weeks after neosalvarsan has been given.

Of ninety-seven treated by Schreiber sixty-one became negative and thirty-six remained positive; one-third of the former were negative at the end of fourteen days. Five of these cases were still negative after four months and seven after three months.

Schreiber has but seldom noted by-effects after neosalvarsan. He had observed an elevation of temperature after the first injection in the florid stage, and drug rashes were also seen in a few patients, but in the majority the reaction was negligible. In my own experience a sharp febrile reaction has occurred sometimes after the first and sometimes after succeeding injections. In three cases a trace of albumin appeared in the urine, but it disappeared again in a few days. In a few cases slight vomiting or diarrhea was also complained of.

Assuming that the solution of salvarsan is properly prepared and that one is familiar with the technic of its administration, it may safely be stated that, given to an individual with intact kidneys, circulatory and nervous system, it is free from danger, and in the majority of cases causes less disturbance than an intramuscular injection of a mercurial salt. Patients repeatedly state to me that they much prefer to take an injection of salvarsan rather than one of salicylate or bichlorid. As the kidneys are chiefly concerned in the elimination of the drug, a nephritis is much more apt to occur when they are not in a healthy condition, and this emphasizes the importance of carefully ascertaining their state before its administration. I have not found albuminuria a contra-indication, but the remedy must be given in small doses.

It is important that the organs of circulation be in a fairly normal condition. The blood-pressure in some cases drops suddenly after the administration of the drug, and the heart's action becomes slow and feeble. In several cases I have noted that the pulse fell to forty. For this reason it is advisable that patients be kept in the recumbent position for several hours after an intravenous injection. From Auer's animal experiments to determine the cause of the fall in blood-pressure, he found that the heart might be so affected that a slight extra strain would throw it into fatal fibrillation. As this did not occur regularly in his animals, he attributed it to an inherent weakness of the cardiac muscle brought out by the injection of salvarsan. The contention of Ehrlich that myocarditis be regarded as a contra-indication for the intravenous injection of the drug, therefore, has experimental support. Whether this action is exerted on the cardiac muscle, on the vagus endings or on both structures could not be definitely stated.

CONCLUSIONS

The efficiency of salvarsan bears a direct relation to the age of the infection.

In the early stage three or four doses supplemented by mercury will in many cases cure the disease in from six months to a year.

The florid stage requires more intensive treatment; five or six doses followed by several mercurial courses are necessary.

In some forms of syphilis of the nervous system the effects of salvarsan are more satisfactory than mercury and potassium iodid.

In malignant syphilis, when mercury has been given over a long period continuously without changing the clinical manifestations or the blood reaction, not infrequently all of the manifestations disappear after one or two doses of the drug. These patients probably develop more or less immunity to mercury, or their strains of spirochetes are more amenable to arsenic treatment.

A reaction uninfluenced by a long course of mercury may be changed by one or two injections of salvarsan. In other words, a combination of salvarsan and mercury is more efficient in changing the blood reaction than either alone. In the primary stage it is possible permanently to reverse the blood reaction with salvarsan, but, as the disease grows older, the probabilities of changing it with only a few doses grow less. The introduction into the system of such large quantities of the drug as is possible with neosalvarsan may so concentrate the treatment that all or most of the organisms are destroyed, but it has not yet been used long enough to enable us to draw definite conclusions.

8 West Seventy-Seventh Street.

4. Schreiber, E.: Ueber Neosalvarsan, München. med. Wchnschr., April 23, 1912, p. 905.

The Special Care of the Nervous Child.—The special care of the nervous child should begin in early infancy and be continued until after puberty. Many of the children are wholly or to a considerable extent bottle-fed babies. Every nervous baby should be fed exclusively on mother's milk for the greater part of the first year if it is possible for sufficient nourishment to be obtained from this source. If not, properly modified cow's milk is the best substitute.—Perry in *Jour. Missouri Med. Assn.*

IDENTIFICATION OF SPIROCHÆTA PALLIDA IN CULTURE *

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The standards by which I identify *Spirochæta pallida* in culture are (1) correct morphology, (2) necessity of the presence of sterile fresh tissue in culture medium, (3) strict anaerobiosis, (4) rather faint hazy growth in solid or fluid mediums without any noticeable change in the proteid constituents, (5) non-production of any offensive odor in culture, (6) capability of inciting an allergic reaction on the skin of certain cases of syphilis and parasyphilis (so-called luetin reaction), (7) specific complement fixation with the antipallida immune serum or certain serums from human cases of syphilis, provided that the antigen is suspended in saline solution and not prepared by an alcoholic extraction, and (8) pathogenicity. The pathogenicity may be gradually attenuated in course of cultivation, but the other seven conditions should be constantly fulfilled.

There are some small spirochete varieties which are difficult to differentiate from the pallida. Morphologically *Spirochæta microdentium and Spirochæta mucosa* (n. s.) closely resemble the pallida, but both of the former can grow in ascitic agar without the addition of fresh tissue, and produce an offensive odor. The *S. mucosa* was isolated by me from a case of pyorrhea alveolaris and is a mucin-producing organism. Neither variety binds complement with the antipallida immune serum when used in an aqueous suspension. From the appearance of the growth *Spirochæta macrodentium* and *Spirochæta refringens* closely resemble the *pallida,* but they are quite different in morphologic features. Neither of these organisms produces any odor in culture and the *S. refringens* grows without the fresh tissue.

In studying the effect of cultural conditions on the life of *Spirochæta pallida* I have observed the appearance of many minute, highly refractory granules in the cultures growing under unfavorable conditions. In such cultures the spirochetes are few in numbers. These minute particles can be distinguished from the serum particles by staining methods. They do not stain with Giemsa when the smear is fixed in methyl alcohol, but take a reddish-violet stain when the film is fixed in sublimate alcohol in wet state. Serum particles remain unstained by either procedure. The ordinary anilin dyes do not stain the granular forms of the *S. pallida.*

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ANAPHYLAXIS TO SALVARSAN *†

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NEW YORK

The use of salvarsan has proved of interest, not only from the standpoint of its curative powers, but also on account of its toxic effects. It is the object of this communication to explain the nature of one of these by-effects.

Practically all drugs with a specific action are poisons. As pointed out by Ehrlich, the relation of curative power to toxicity determines the value of any preparation, and it is the object of the synthetic chemist to furnish a compound with high therapeutic properties as compared to toxic action. In salvarsan we have an active therapeutic agent, but certain toxic properties of the drug have not escaped notice. In fact, the study of the immediate toxic symptoms following intravenous injections has led to an improvement in technic which has rendered possible a much more thorough application of the drug. Wechselmann's discovery, that stale water or saline containing molds or saprophytic bacteria is responsible for the symptoms resembling those of acute arsenical poisoning which formerly were so common following injection of the drug, is one of the most important contributions since the discovery of salvarsan. The use of absolutely freshly distilled and sterilized water has entirely changed our ideas of the toxicity of the drug, so that now it is considered to be even less toxic than mercury.

Several cases of encephalitis hemorrhagica following intravenous injections of salvarsan have been reported. Fischer,[1] in discussing a case which he studied, suggested that this lesion might be due to a hypersensitive condition of the patient, since the symptoms followed a second injection. Hoffmann and Jaffé,[2] and Levens[3] have reported cases showing severe intoxication, starting with anaphylactic-like symptoms immediately after a second intravenous injection, and think that these symptoms occurred in association with a state of hypersensitiveness induced by the first injection. Marschalko,[4] however, in reporting a similar reaction, which followed a first injection of 0.28 gm., considered that the reaction was due to the use of mold-containing water. An experience of ours supports this view. A patient shortly after his fourth intravenous injection of 0.4 gm. went into a state of collapse, which was followed by a high fever, marked gastro-intestinal symptoms, herpes and anuria. The little urine passed the next day boiled solid and contained many casts. The signs of nephritis gradually disappeared, as did the other toxic symptoms, and the patient's condition returned to normal. This case might have been explained as one associated with hypersensitiveness induced by previous treatment, had not the subsequent administration of salvarsan disproved this view. Subsequently the patient had eleven injections of salvarsan. During a period of eight months he had five injections of 0.2 gm. each, followed later by six injections of 0.3 gm. each. Absolutely no toxic symptoms or evidence of renal irritation followed any of these later treatments. The toxic symptoms occurred before we were accustomed to use freshly distilled water, while in the eleven injections following, in which there were no symptoms of intoxication, a more careful technic was followed. It is of interest to note that the above-mentioned cases of intoxication occurred before Wechselmann's discovery.

In florid syphilis one frequently sees a fever and general malaise following the first injection of salvarsan. This picture is probably due to the setting free of some toxic substances from the spirochete.

In addition to these by-effects, a symptom-complex resembling acute anaphylaxis occasionally occurs after repeated intravenous injections of salvarsan. In our experience it has occurred only after repeated injections.

* Read in the Symposium on Mercury and Salvarsan in the Treatment of Syphilis in the Sections on Pathology and Physiology and Dermatology of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

* † From the Hospital of the Rockefeller Institute for Medical Research, New York.

1. Fischer, B.: München. med. Wchnschr., 1911, lviii, 1803.
2. Hoffmann, E., and Jaffé, J.: Deutsch. med. Wchnschr., 1911, xxxvii, 1337.
3. Levens: Med. Klin., 1911, vii, 852.
4. Marschalko: Deutsch. med. Wchnschr., 1911, xxxvii, 1702.

Such an attack comes on usually after 30 to 50 c.c. of solution have been introduced. There is a facial expression of anxiety, the patient complains of a feeling of pressure in the epigastrium or cardiac region; this is followed shortly by a sense of suffocation, and a number of times the patients have described a sensation "as though the heart were in the throat." Shortly after this there is a bright red suffusion of the skin of the face, most marked about the eyes; at times, it involves the entire body. In marked cases the eyelids and lips appear swollen. Occasionally the red color changes to a purplish cyanosis. As a rule there is but little change in the pulse-rate, although once it was much increased. The respirations increase slightly in rapidity. The symptoms seem to be largely vasomotor in nature and usually pass off rapidly on stopping the injection.

The stage of the disease does not seem to be an important factor in determining whether the reaction will occur or not. Five of our patients were in the secondary period, two in the tertiary and one had tabes. Three times the first reaction occurred during the fourth injection of a series, twice during the fifth injection, three times during the sixth and once with the seventh. It has recurred with the succeeding treatment in three cases; twice the next treatment did not induce a reaction; once the reaction reappeared at the time of the second succeeding injection following the first reaction. In the patient who showed the most severe reactions, occurring with the fifth and sixth treatment, neosalvarsan was injected two weeks after the last reaction and no symptoms followed. Another patient with a severe reaction during his sixth injection had no reaction with an injection of neosalvarsan a week later. Three times the second reaction was much more intense than the first. Two of the patients showed a skin hypersensitiveness. One, a patient with tabes, had a purpuric eruption on the legs following the first treatment. He also has shown a similar eruption after iodids. The other, a patient with leukoplakia, developed a severe vesicular dermatitis after his eighth treatment. He then was without treatment for eight months, at the end of which time a single intravenous injection of 0.3 gm. was accompanied by a sensation of pressure in the chest, followed in four hours by a generalized erythematous eruption which later became vesicular. This case is an excellent example of hypersensitiveness induced by previous treatment. In three other patients the hypersensitive condition passed off in five weeks, three, and four months, respectively. In one of these it returned at the time of a fourth injection.

Iwashenzow[5] has reported a series of fifteen patients who showed similar symptoms. Fourteen of them had the reaction at the time of the fourth injection, and one with the fifth treatment. His treatment consisted of an intravenous injection of 0.2 or 0.3 gm. salvarsan repeated every two weeks. All of his patients had some syphilitic involvement of the central nervous system. He showed by injecting saline alone that the reaction was not due to proteid substances in the saline used for dissolving the salvarsan. Iwashenzow's cases have one feature in common with ours, i. e., the symptoms followed the repeated intravenous injection of 0.2 or 0.3 gm. The interval between treatments in his cases was two weeks, in ours usually seven days. In both series the reaction occurred with or after the fourth injection.

The reactions seem to be anaphylactic in nature because they appear only after repeated injections; the respiratory symptoms and feeling of oppression and the vasomotor manifestations are similar to those observed in anaphylaxis to a foreign proteid. They differ from serum anaphylaxis in that the period of anti-anaphylaxis is shorter or does not exist at all, although this point has not been sufficiently investigated. In two of our patients with very marked symptoms the injection was renewed after ten minutes without any return of the reaction. This might be interpreted as evidence that a condition of anti-anaphylaxis existed.

TABLE 1.—EXPERIMENT ON THE TOXICITY OF A SECOND INJECTION OF A MIXTURE OF SALVARSAN AND GUINEA-PIG SERUM

First Injection						Second Injection							
Guinea-Pig	Weight (Gm.)	Method	Salvarsan (Mg.)	Guinea-Pig Serum (C.c.)	Stood (Min.)	Interval (Days)	Weight (Gm.)	Method	Salvarsan (Mg.)	Guinea-Pig Serum (C.c.)	Saline (C.c.)	Stood (Min.)	Symptoms
B 46	300	Intraven.	5	3	70	25	300	Intraven.	5	3	.	40	Practically none.
B 54	250	Intraper.	5	3	80	22	240	Intraven.	5	3	.	15	Prostration, dyspnea; died in ten min. Autopsy: distended lungs.
B 62	Control.....						220	Intraven.	5	.	3	5	None.
B 64	Control.....						220	Intraven.	5	3	.	30	None.
B 65	Control.....						220	Intraven.	5	3	.	40	None.

In recent years there has been a growing tendency to consider hypersensitiveness to certain drugs as an anaphylactic phenomenon. By passively sensitizing guinea-pigs with the serum of patients who showed an idiosyncrasy to iodoform and antipyrin, Bruck[6] demonstrated the anaphylactic nature of the hypersensitiveness to these drugs. Klausner[7] confirmed these observations with the serum of patients unusually sensitive to both iodoform and iodids. Friedberger and Ito[8] were able to sensitize guinea-pigs actively with a mixture of guinea-pig serum and tincture of iodin. After an interval of two to three weeks these animals were hypersensitive to the same mixture or to sodium iodid or Lugol's solution. A first injection of Lugol's solution induced a condition

5. Iwashenzow, G.: München. med. Wchnschr., 1912, lix, 806.
6. Bruck, C.: Berl. klin. Wchnschr., 1910, xvii, 517, 1929.
7. Klausner: München. med. Wchnschr., 1910, lvii, 1451.
8. Friedberger, E., and Ito, T.: Ztschr. f. Immunitätsforsch, 1912, xii, 241.

of hypersensitiveness to iodized guinea-pig serum, but not to sodium iodid or Lugol's solution. The iodin seemed to alter the native serum so that it acted like a foreign proteid. Last year Auer[9] tried to sensitize guinea-pigs with salvarsan and after a suitable period attempted to induce shock by a second injection of salvarsan. His results were entirely negative.

In approaching this problem, I have mixed salvarsan with guinea-pig serum and used this mixture for both the sensitizing and intoxicating doses. In the first series of experiments guinea-pigs were injected intraperitoneally with a mixture of salvarsan and serum, and after four weeks were injected intravenously with a similar mixture. At the time of reinjection the pigs showed toxic symptoms resembling anaphylaxis, while controls injected with the same amount of the mixture or with salvarsan alone showed no symptoms at all. In subsequent experiments the controls of one day served as sensitized animals after a suitable lapse of time.

Table 1 shows a typical experiment. One of the guinea-pigs, B.46. was sensitized by intravenous injection of salvarsan and guinea-pig serum, and on reinjection with a similar mixture after twenty-five days showed no symptoms. The other was first injected intraperitoneally, and after twenty-two days was reinjected intravenously. It showed immediate prostration, marked inspiratory dyspnea and death in ten minutes. The autopsy, performed immediately, showed the heart still beating. The lungs were much distended, filling the entire thoracic cavity. They had a leathery feel and on section were dry. This animal showed a typical anaphylactic death, with characteristic condition of the lungs described by Auer and Lewis.[10] At the beginning of the experiment the toxicity of salvarsan diluted with saline as well as that of a mixture of the same amount of salvarsan and serum were tested on normal guinea-pigs, and at the end of the experiment another control was injected with salvarsan and serum to prove that the mixture had not become toxic during the time of the experiment. This double control was used throughout the series, because it was found that the salvarsan rapidly becomes toxic on standing. It was found necessary to work with freshly prepared salvarsan solution and with fresh serum. The salvarsan was a 1 per cent. alkaline watery solution, always made with freshly distilled and sterilized water. The saline used in the controls was freshly prepared in the same way. The guinea-pig serum was obtained by bleeding the pigs in the usual way and separating the serum from the clot by centrifugalization. The serum was used within six hours of the time of bleeding, as it was found that old serum formed a more toxic mixture than fresh serum. This toxic effect with the first injection of controls was carefully watched and only those experiments in which it was not shown were accepted. It was found that guinea-pigs which weighed only 200 to 220 gm. were unsuitable, because a number showed toxic symptoms or death on first injection of 5 mg. of salvarsan mixed with guinea-pig serum. It will be seen in Table 3 that all the animals which showed anaphylactic symptoms weighed 240 gm. or more.

TABLE 2.—COMPLETELY CONTROLLED EXPERIMENT ON TOXICITY OF SALVARSAN-SERUM MIXTURE

	First Injection—Intravenous						Second Injection After Forty-Two Days—Intravenous					
Guinea-Pig	Weight (Gm.)	Salvarsan (Mg.)	Guinea-Pig Serum (C.c.)	Saline (C.c.)	Stood (Min.)	Symptoms	Weight (Gm.)	Salvarsan (Mg.)	Guinea-Pig Serum (C.c.)	Saline (C.c.)	Stood (Min.)	Symptoms
B. 13	320	5	2	...	15	Slight cramps.	290	5	3	...	37	Slight dyspnea; tremors, one hour; cramps, 30 minutes.
B. 26	290	5	2	...	15	None.	290	5	3	...	50	Jumping, 20 minutes; cramps, 1½ hours.
B. 14	270	5	2	...	23	None.	320	5	.	3	60	None.
B. 25	270	5	2	...	15	Moderate cramps.	220	.	3	0.5	5	Slight dyspnea, one-half hour.
B. 20	270	5	.	2	12	None.	290	5	3	...	50	None.
B. 27	240	3	.	1.5	18	None.	270	5	.	3	70	None.
B. 23	270	.	2	0.5	5	None.	320	5	3	...	40	None.
B. 44	Control.....						270	5	.	3	7	None.
B. 45	Control.....						270	5	3	...	18	None.
B. 46	Control.....						300	5	3	...	70	None.

Table 2 shows a completely controlled experiment. Two pigs previously injected with the salvarsan-serum mixture showed marked toxic symptoms on reinjection with a similar mixture, while controls which received at the same time either salvarsan or serum alone were free from symptoms. Also pigs which received a first injection of salvarsan alone showed no symptoms on reinjection with salvarsan and serum or salvarsan and saline. This experiment proves that it is necessary both to sensitize and to shock with a mixture of salvarsan and serum.

A complete list of the animals used in eight different experiments is given in Table 3. In each of the experiments normal animals of the same or less weight than the sensitized animals of the day were used to control the toxicity of the salvarsan-serum mixture. Among nineteen sensitized animals three died acutely at the time of the second injection and had characteristic autopsy findings, two had very marked symptoms, four showed marked symptoms, three had slight symptoms and seven showed no symptoms on reinjection. The first series of

9. Auer, J.: Jour. Exper. Med., 1911, xiv, 497.
10. Auer, J., and Lewis, P. A.: Jour. Exper. Med., 1910, xii, 151.

eight controls demonstrates that it is necessary to use both salvarsan and serum at both injections. Seventeen normal controls gave no evidence of intoxication with the first salvarsan injection, and in seven other normal animals the salvarsan when diluted with saline was not toxic.

This series of experiments demonstrates a very interesting effect of salvarsan. An animal never shows an anaphylactic reaction with untreated homologous serum. The salvarsan alone in the dose employed is not toxic for the guinea-pigs, nor does a single injection of salvarsan render a guinea-pig hypersensitive to a subsequent injection. Nevertheless, the mixture of salvarsan and serum, which on first injection is non-toxic, so alters the condition of the animal that a second injection of the same mixture is toxic. It seems that the action of the salvarsan on the serum changes the nature of the serum so that it acts like a foreign proteid and induces the condition of hypersensitiveness. This is analogous to the alteration in a homologous serum by iodids, which was demonstrated by Friedberger and Ito. In our series of experiments, however, the anaphylactic condition was not induced by the pure chemical substance alone. The possibility is suggested that in mixtures of chemical substances and blood-serum, combinations may occur which alter the nature of the protein in such a way that when injected into animals of the same species from which it was derived, it may react in the manner of a foreign protein. Whether such combinations occur *in vivo* on first administration of a drug and so induce the sensitization of the individual is a matter of considerable interest in the study of drug idiosyncrasies.

In the patients who showed anaphylactic-like symptoms after repeated injections, some such reaction may have occurred. When introduced into the blood-stream, a combination of salvarsan takes place with the serum. Repeated injections and combinations of this nature probably cause the body to immunize itself against this denaturized serum, so that on a fourth or subsequent injection sufficient alteration in the reactive powers has been brought about to produce the peculiar set of symptoms. The hypersensitive condition developed by patients after repeated injections of salvarsan passes off after a certain period of time. In one patient, however, this condition was more easily induced and the symptoms were more severe with a second series of injections than with the first. This is an example of so-called accelerated reaction. In another patient the hypersensitive condition persisted for more than eight months. Whether moderate-sized doses of salvarsan predispose more to the development of the condition than large doses is still an open question. The condition is one which is relatively infrequent, and when it occurs, if its nature is recognized, need not necessarily be serious. The immediate treatment during the attack is to discontinue the injection. At times the injection may be renewed after ten minutes without a return of the symptoms. This insusceptibility may be explained as a condition of anti-anaphylaxis. If subsequent injections are necessary, our experience with two cases seems to indicate that neosalvarsan may be substituted for salvarsan. After a certain lapse of time the hypersensitiveness usually disappears and then treatment may be renewed.

TABLE 3.—A COMPLETE LIST OF ANIMALS USED IN EIGHT EXPERIMENTS

Guinea-Pig	Weight (Gm.)	Method	Salvarsan (Mg.)	Guinea-Pig Serum (C.c.)	Saline (C.c.)	Symptoms	Interval (Days)	Weight (Gm.)	Salvarsan (Mg.)	Guinea-Pig Serum (C.c.)	Saline (C.c.)	Stood (Min.)	Symptoms
13	440	Intraper.	2.5	1	...	None.	28	500	11	1.1	...	45	Dyspnea; prostration; death in 2 hours. Autopsy: distended lungs, hemorrhages in stomach
B 1	400	Intraven.	10	1	...	None.	20	400	1	0.5	...	10	Dyspnea; prostration; death in 3 hours. Autopsy: distended lungs
B 54	250	Intraper.	5	3	...	None.	22	240	5	3	...	15	Dyspnea; prostration; death in 10 min. Autopsy: distended lungs.
14	440	Intraper.	2.5	1	...	None.	50	440	5	2	...	10	Dyspnea; prostration; nystagmus. Recovery.
		Intraven.	10	3	...	Cramps	19						
16	440	Intraper.	20	1	...	None.	29	550	5	3	...	45	Prostration; dyspnea. Recovery.
12	500	Intraper.	1	1	...	None.	29	490	7.5	3	...	50	Prostration. Recovery.
14	440	Intraper.	2.5	1	...	None.	29	440	10	3	...	40	Cramps; sneezing. Recovery.
B 13	320	Intraven.	5	2	...	Slight cramp. 10 minutes.	42	290	5	3	...	5	Slight dyspnea; tremors 1 hour; cramps 30 minutes. Recovery
B 26	290	Intraven.	5	2	...	None.	42	290	5	3	..	37	Jumping 20 minutes; cramps 1½ hours. Recovery
B. 3	400	Intraven	10	3	...	None.	19	400	5	2	...	5	Slight cramps one-half hour. Recovery.
B 5	400	Intraven	10	3	...	Cramps.	13	400	5	2	...	15	Slight prostration 25 minutes. Recovery.
B 6	350	Intraven.	5	3	...	Slight cramp.	24	420	5	2.5	...	30	Dyspnea 15 minutes. Recovery.
B 64	220	Intraven.	5	3	...	None.	21	200	5	3	...	45	None.
B. 4	350	Intraven	10	3	...	None.	19	350	5	2	...	15	None.
B. 46	300	Intraven.	5	3	...	None.	25	300	5	3	...	40	None.
12	500	Intraper.	1	1	...	None.	32	490	5	2	...	10	None.
		Intraven.	7.5	3	...	Prostration; rapid recovery.	13						
B 7	500	Intraven.	5	3	...	None.	24	520	5	2.5	...	22	None.
B. 8	350	Intraven.	5	3	...	None.	24	370	5	3	...	10	None.
B 68	200	Intraper.	5	3	...	None.	21	240	4	2.4	...	70	None.
CONTROLS													
B 14	270	Intraven	0.5	2	...	None.	40	320	5	...	3	60	None.
17	540	Intraper.	20	.	2	None.	29	540	5	3	...	10	None.
B. 62	220	Intraven.	5	.	3	None.	21	300	5	3	...	40	None.
B 20	270	Intraven.	5	.	2	None.	42	290	5	3	...	50	None.
B 27	240	Intraven.	3	.	1.5	None.	42	270	5	...	3	70	None.
B. 23	270	Intraven.	...	2	0.5	None.	42	320	5	3	...	40	None.
11	400	Intraper.	...	1	...	None.	29	420	5	3	...	30	None.
B. 25	270	Intraven.	5	2	...	Cramps: moderate.	42	220	..	3	0.5	5	Dyspnea, slight, one-half hour.

UNSENSITIZED CONTROLS

Guinea-Pig	Weight (Gm.)	Salvarsan (Mg.)	Guinea-Pig Serum (C.c.)	Saline (C.c.)	Stood at 37° (Min.)	Symptoms
B. 1	400	10	1	...	60	None
B. 36	290	5	2	...	18	None
B. 8	350	5	3	...	25	None
B. 6	350	5	3	...	15	None
B. 45	270	5	3	...	18	None
B. 46	300	5	3	...	70	None
B. 64	220	5	3	...	30	None
B. 65	220	5	3	...	40	None
B. 30	350	5	2	...	5	None
B. 31	250	5	2	...	20	None
B. 33	290	10	2	...	5	None
B. 34	320	10	2	...	15	None
B. 4	356	10	3	...	25	None
B. 5	400	10	3	...	65	None
B. 42	250	5	2.5	...	10	None
B. 43	290	5	3	...	60	None
B. 78	270	4.5	2.7	...	30	None
B. 37	350	5	...	2	60	None
B. 44	270	5	...	3	7	None
B. 62	220	5	...	3	5	None
B. 32	300	5	...	2	5	None
B. 3	400	10	...	3	40	None
B. 41	300	5	...	3	10	None
B. 77	270	4.5	...	2.7	20	None

SUMMARY

After repeated injections of salvarsan, certain patients show symptoms of a respiratory and vasomotor nature like those seen in anaphylaxis, and in one of our cases there occurred a toxic erythema. Guinea-pigs which have been sensitized by the injection of a mixture of guinea-pig serum and salvarsan, and have been reinjected, after a suitable time, with the same mixture, show symptoms like those seen in anaphylactic shock. This acts like a foreign proteid. In patients who show anaphylactic symptoms on repeated injections of salvarsan, a similar reaction probably takes place between the native serum by salvarsan so that the homologous serum phenomenon seems to depend on an alteration of the patient's own serum and salvarsan.

THE PROPER PLACES OF MERCURY AND SALVARSAN IN THE TREATMENT OF SYPHILIS *

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This attempt to formulate the proper place of mercury and salvarsan in the treatment of syphilis must be recognized as presenting the view of the clinic rather than that of the laboratory.

It is an evident fact that the natural history of a disease must be known before the effects of such disturbing elements as drugs can be properly understood.

In the study of the therapeutics of syphilis there are certain facts in the natural history of the disease which must be kept in mind. Syphilis owes its existence to a microorganism which penetrates the body at some point in the external surface and then by the lymph- and blood-vessels spreads through the entire organism and may show itself sooner or later in any part of the body. The disease has the peculiarity of appearing locally at some point after years of quiescence. Treatment is apparently successful for many years only to show at last that the disease still lingers, that the spirochetes have flourished in some little-suspected spot and have there wrought irreparable damage. Its lesions are wonderfully various; as time goes on its importance as a cause of the most varied symptoms is shown to be greater and greater, and the character of the lesions it may originate are seen to be more and more varied. As our knowledge of the disease has increased our means of treatment have grown less satisfactory. It is, I believe, true that the majority of syphilitics recover; but the number of serious results is far too great to allow us to rest content. The remedies in our hands are too valuable to be depreciated. We ought, rather, to be encouraged, but there is still something wanting.

The disease is not to be classed as self-limited, at least not in the sense that pneumonia and perhaps typhoid are self-limited. Its treatment is not simply the support of Nature during a limited period while the disease accomplishes its cycle. It is the combating of an entity. Reports of cures after an observation of only a few months must be received with great caution.

With a disease that involves the whole of the human frame, which may appear suddenly in any minute portion of the body, it is necessary to keep in mind its various phenomena lest we be led astray into attributing to other causes, perhaps to medication, the natural symptoms of the disease.

MERCURY

The value of mercury in the treatment of syphilis is abundantly proved by clinical experience. We know that symptoms disappear under its influence in a wonderful manner. Even those who object to its habitual use recognize the fact that it causes the rapid disappearance of outward manifestations in a large proportion of cases.

Clinical experience is confirmed by scientific observation. Spirochetes are banished from local lesions by local applications or by the internal administration of mercury. The Wassermann reaction is rendered negative, temporarily at least. But to reach the best results it is necessary to continue its use for a series of years. The wider our experience, the less does the drug look like an absolute cure.

Its defects are shown by the occasional reappearance of new symptoms at the very time when the patient is under the influence of the drug; by the existence of occasional individuals on whom its otherwise wonderful powers have little effect and by recurrences after apparent cures by its use — recurrences which may involve any part of the body but which are common in connection with some part of the nervous system.

As a final and absolute cure, mercury is too often a disappointment. It fails, not because it is not fatal to spirochetes, but from some one of various reasons, either because we fail somehow in our technic, or because spirochetes find refuge somewhere beyond the reach of our remedies, or because spirochetes differ in their characteristics and some are less sensitive to our remedies. No matter how long or how faithful our treatment with mercury or what form of administration we use we are never able to say to our patients that they are absolutely and finally cured beyond the possibility of a recurrence.

Probably no drug in the pharmacopeia has been subjected to more severe criticisms than mercury. So great was the prejudice at one time that certain men proclaimed themselves as antimercurialists. It was declared by some that the cure was worse than the disease. The great prejudice against it seems to have been due to its abuse or rather to its unwise use beyond its therapeutic dose or until its toxic properties were manifested, and

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this excessive use of the drug was due to a belief that it must cure if only given long enough and in sufficient doses. We have learned how to avoid its dangers and to profit by its powers for good.

No account of mercury in the treatment of syphilis is complete without mention of the iodids. As adjuvants they are most valuable. In the pains of periosteal disease they are more effective than opium, and in the affections of the nervous system they deserve the highest praise. The treatment of syphilis without their aid would be extremely unsatisfactory. But wonderful as they are, they also fall short of that lasting and definite cure which is our aim.

SALVARSAN

In salvarsan we were promised a speedy cure by a single dose. That original promise has not been fulfilled, but we have been given a drug which in rapidity of curative action is marvelous. It accomplishes in days results which are effected by mercury only after weeks or months, but a little time has been sufficient to show that the disease still retains its natural characteristics. Recurrences take place after salvarsan. The nature of the disease is not changed. It is found necessary to repeat the dose, that the spirillicide effects may be prolonged. But no drug can be expected to show powers as great as those of salvarsan without at the same time demonstrating its ability to do injury. There is no drug of really active properties for good without also the ability in excessive dose or in especially sensitive individuals to do harm. Salvarsan is already credited with a certain small number of deaths. They require scrutiny to determine, if possible, whether they were preventable or whether they were the inevitable result of the use of the drug. Most of them have been reviewed by Ehrlich himself. In the first place the small number reported is to be noted. Perhaps they are no more numerous than those that follow the administration of chloroform. Of these deaths some may have been due to overdoses and several must be considered as sequels rather than results of the administration of the drug. It is impossible to resist the desire to use salvarsan as a last resort in desperate cases. Such use of the drug may be compared to the use of surgical means of rescue in a desperate case. The newspapers speak of the patient as dying of the operation, although the primary cause of death was the disease from the fatal effects of which the operation was unable to save him. But outside of the deaths reported after the administration of salvarsan, the cranial nerves have shown a tendency to be affected, as exemplified by deafness, facial paralysis, dizziness and staggering gait in a small number of patients.

These symptoms are said by certain individuals to be the result of salvarsan and afford such persons a reason for discarding its further use. By other men these symptoms are believed to be due to the disease and to the fact that the drug has failed to reach certain spirochetes. There is, once more, the necessity of studying the natural history of the disease before one can pronounce judicially on the effects of remedies.

DEAFNESS IN SYPHILIS

It must be recognized that before the advent of salvarsan deafness was observed by a large number of authors, American as well as foreign, as a result of syphilis in its earliest as well as in its latest stages, although there seems not to have been perfect accord as to the pathologic lesion. I will quote only American authors. In 1897 Dr. E. A. Crockett, one of the aural surgeons of the Massachusetts Eye and Ear Infirmary, reported cases of syphilitic affections of the ear occurring early after the inception of the syphilis with symptoms of ringing in the ears, deafness, vertigo, facial paralysis, unsteady gait and occasional vomiting. The first of his reported cases came on about six months after a syphilis which had been entirely untreated. In another case exactly the same symptoms came on after the same interval of about six months, although the patient had been under careful treatment and was at the time of the onset of the deafness taking mercury and iodid in full doses. Dr. Crockett had seen some fifteen or twenty cases of this sort during the year since his attention had been called to the subject. Sexton, Bumstead, Sturgis and Turnbull, all writing before the advent of salvarsan, made similar observations.

It is evident that the cases of deafness are syphilitic and are properly designated as neurorecurrences. The only question remaining then is whether such aural symptoms are more frequent after salvarsan. Salvarsan conjointly with the other advances in connection with syphilis of the last ten years has given such an impetus to the study that it is possible that more careful observation has something to do with this apparent increase in aural cases. The sequence, however, is sufficiently marked to demand a most careful examination.

The fear of possible evil consequences must not close our eyes to the wonderful good. It may make us a little slow to urge the drug on the cautious. But were the worst allegations realized, they would be less to be dreaded than the fatal effects of tabes and general paralysis, which we hope to forestall. The accidents are certainly wonderfully few. We may, perhaps, regard the use of this new drug as surgeons have regarded various serious operations—dangerous at first, their danger has been gradually diminished almost to the point of extinction by experience and improvement in technic.

THE USE OF SALVARSAN, MERCURY AND THE IODIDS

We have, then, a disease which continues to show its obstinate tendency to recurrences in spite of all interference, and two drugs which are possessed of wonderful virtues but neither of which is absolutely able to change the nature of the disease. The question is not which we shall choose but how we may best utilize the two. Mercury is always at hand, is easily administered, requires no previous training, has passed beyond the time when it is looked on with special dread and in company with its ally, potassium iodid, accomplishes extremely good results. It continues to be the choice of many. Its usefulness is not diminished by the advent of salvarsan. It must be used in cases in which the use of salvarsan is difficult and in cases of syphilis occurring in persons already suffering from other diseases, notably of the heart or kidney. It must be used in cases in which the disease continues, in spite of repeated doses of salvarsan, to show recurrences.

Salvarsan gives promise of aborting the disease if administered before secondary manifestations. It causes certain symptoms, in which mercury fails, to disappear and we have reason to hope that after sufficient time it will show a radical cure in a greater number of cases. But the number of cases in which relapses have occurred makes it desirable to continue spirillicide action between doses and beyond the single or repeated dosage of salvarsan, and this must be done by mercury.

Let us pursue the subject further by examining the action of the two drugs under different circumstances. Of the value of the local action of mercury there can

be no doubt. Experiments on monkeys with calomel ointment by Metchnikoff and Roux have demonstrated that such an ointment thoroughly rubbed into the spot of inoculation within a few hours prevents infection. A single experiment on a human subject has confirmed the observation.

This demonstration of the value of mercury if locally applied immediately to the spot of inoculation may at first thought seem of little practical value. It is true that in practice the opportunities for immediate application must be indeed few, but it may be of the greatest value to the practitioner when he has reason to fear that he has brought the virus into contact with wounds on his own hands. We have the assurance that mercurial or calomel ointment rubbed faithfully into the infected spot may destroy the virus and prevent the inoculation from taking place. This demonstration also justifies the preventive use after exposure, as is now practiced in the armies and navies of several nations. We have reason to believe that the amount of syphilis has been materially diminished by this wholesale application.

The statement so common a few years ago and fortunately less often heard at present, "Wait for secondary symptoms before beginning treatment," ought to be supplanted by some such adage as this: "Begin energetic treatment as soon as a positive diagnosis is made, and take pains to make that diagnosis as early as possible." Between the incubation—confrontation—the clinical picture—glandular reaction—the finding of spirochetes, and occasionally the Wassermann reaction, it ought to be possible to make a diagnosis without waiting for secondary symptoms in a large proportion of cases. It is certainly easier to make a diagnosis of the primary sore at present than it was a few years ago, from the clinical point alone. The improvement in cleanliness diminishes the amount of suppuration which obscured the diagnosis. The lapse of time since the primary sore was first distinguished from other lesions has brought into greater prominence its characteristics. In view of the fact that spirochetes are not always obtainable and that a positive Wassermann reaction is not obtained in all cases until after the sore is clinically recognizable, it seems right to emphasize the study of its clinical aspects. A certain amount of caution, however, ought to be exercised in acting on clinical evidence alone. One advantage of the principle of waiting until secondary symptoms have developed lies in the fact that the patient as well as the physician sees the correctness of the diagnosis. It is to be desired that no opportunity be left to dispute the diagnosis later, on the part either of the patient or of practitioners who may subsequently be consulted.

That treatment in the early cases should be begun immediately is beyond question. Exactly how it should be begun is not unanimously agreed on. There is, perhaps, room for difference of opinion, but it is not so much a question of choice between mercury and salvarsan as a question how to gain the advantages of both drugs. The observations of many years in the use of mercury allows one to say that the primary sore heals much more quickly under treatment by salvarsan. So far, it seems that salvarsan given at the earliest moment offers relatively better assurance of a cure than other drugs. The effect seems almost instantaneous. We may, then, believe that with salvarsan administered as soon as possible and with a mercurial as a local dressing and internally, we are doing all in our power toward the cure of the patient. It has been permitted me to treat in this manner four brother practitioners with chancres of the finger and to see the primary sore heal and all other symptoms remain absent for several months, in one case a year up to the present time. It is no small gratification to keep members of our profession thus at work.

In secondary syphilis, in which mucous patches and lesions of the mouth abound, the work of salvarsan in causing such lesions to disappear is most rapid, but in the disappearance of superficial skin eruptions its superiority to mercury is much less marked. It is during this period that the majority of neurorecidives have occurred. It is the time when the disease is most general and most active. It is especially the time when both drugs should be used.

In the destructive lesions of late syphilis we have remedies of the greatest value in the combined use of mercury and the iodids. There is no one accustomed to treating syphilis by mercury and iodid who has not seen many a threatening lesion heal as by magic under the influence of those drugs. In fact there used to be a feeling that the physician had somehow failed in his duty if such lesions refused to heal under his care. Yet there are certain cases which are resistant to mercury and iodids no matter how used—cases which have deservedly acquired the name of mercury-resistant. These are the cases which persist in spite of all that can be done, improving for the moment only to relapse, until finally a hopeless condition is reached to which death is preferable. In no class of cases are the results from the use of salvarsan more brilliant; they are like a recall from the grave.

The treatment of congenital syphilis is a fruitful subject of study which is coming into prominence. It is possible to make great changes in the condition of hereditary syphilitics by faithful and persistent therapeutic measures. It is not so fully recognized as it should be in all our charitable organizations that these children are capable of improvement and of return to something near the normal standard in a large proportion of cases.

The persistent use of mercurials is to be praised for its benefit, but it has been my good fortune to assist various ophthalmic surgeons by the application of salvarsan to children whose eyes were going badly, with improvement in all cases. Several severe cases of keratitis have certainly been helped by salvarsan.

There is another class of patients who deserve attention, and in regard to whom it has been a question how they shall be treated, namely, the apparently healthy mothers of syphilitic babies. It has long been established that these women are syphilitic, but the fact of their syphilis has been emphasized by the results of serologic study. If they are to continue to bring forth children, they ought to be treated for the sake of their unborn offspring. Many have hesitated to treat these apparently healthy women and have been content with treating the fathers, but now it has become evident that mothers must also be treated. They are difficult to treat by mercury, as they are not willing to continue treatment for a long period in the absence of all signs of disease, and salvarsan offers a quick and ordinarily safe cure. In the one case which has fallen under my notice, a healthy child has been produced.

SALVARSAN AS A PUBLIC PROTECTION

No consideration of the treatment of syphilis at the present day would be complete which stopped with the consideration of the individual. The relation of the syphilitic to the community must be considered. It is

established that the state shall protect its citizens against infectious diseases, but its duty in regard to syphilis has been neglected too long. Questions of morality have been allowed to obscure the simple fact that syphilis is an infectious disease, and the treatment required extended over so long a time that the detention of the individual was expensive and difficult. Salvarsan offers a new and easier method of controlling these patients. It is a far different matter to inject a fluid into the veins of a person dangerous to the public health from what it is to keep that patient for a series of months or even years at the public expense. If one hesitates in applying salvarsan in general, it is a remedy of the utmost value in the protection of the public. There are certain reckless, careless, ignorant individuals in whom syphilis is a particular peril to those about them. Salvarsan affords the community protection against such individuals, whether men or women. The drug should be used on syphilitic individuals in jails and almshouses and in hospitals. It should be used on individuals who threaten to infect their children and their families. In all these cases it is a peculiar blessing.

CONCLUSIONS

We must, then, retain mercury because its usefulness is not diminished in the least by salvarsan; because it can be used when the use of salvarsan is difficult and when it is contra-indicated. It may do harm if pushed beyond its therapeutic dose, but properly used it relieves and I believe that in some cases it cures; but it always leaves the future uncertain.

We must thankfully accept salvarsan, for it seems to abort the disease at its earliest appearance, especially with the help of mercury. It banishes the symptoms in many cases in which mercury fails. Unfortunate sequels are so few in comparison with fortunate results that they should stimulate closer study to interpret and diminish them. If the promise of the past year is fulfilled, we are nearer the cure of syphilis than we have ever been before. Especially must we be thankful for the impetus given to the study of syphilis. We may confidently look forward to a time when our present methods will seem crude—to a time when we shall be able to gauge the effect of our remedies more accurately, and when salvarsan shall be replaced by an even better drug.

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THE RELATIVE VALUE OF MERCURY AND SALVARSAN FROM A SEROLOGIC POINT OF VIEW *

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The action of salvarsan on the clinical manifestations of syphilis is well understood at the present time. Its temporary effect on the Wassermann reaction is also fairly well known. To judge, however, of its ultimate effect on the disease either from a clinical or serologic standpoint will be possible only after many years have elapsed. It will therefore be seen that at the present time a serologic comparison of mercury and salvarsan must of necessity be unsatisfactory.

In attempting to collect statistics of various observers on the serologic action of the two remedies, we are confronted with very great difficulties. In the case of mercury the figures vary greatly according to the thoroughness of treatment, the preparation and administration of the drug and the stage of the disease at which the remedy is given. Indeed, there is even now no absolute agreement as to the very best method of using mercury. In the case of salvarsan the difficulties are still greater owing to the newness of the remedy. A large number of the reports deals with methods of treatment (subcutaneous and intramuscular injections) which at the present time, except in the case of children, are practically discarded. A further difficulty in judging of the action of salvarsan alone is due to the fact that at present the majority of syphilographers are using it in combination with mercury. Again, the number of serologic reports on the action of salvarsan is very small in comparison with the enormous number dealing with the clinical aspect of the subject.

In attempting a comparative study that appeared to be rather hopeless at the outset, I have realized the difficulty in drawing conclusions from statistics. It would be possible, I feel, for a prejudiced observer to prove his case in favor of either mercury or salvarsan. My efforts would have indeed been discouraging if it were not for the striking results that have been noted in the abortive treatment of the disease, which will be later discussed.

In judging of the serologic action of mercury I have compiled the records (Table 1) of twenty-one observers. Most of these reports deal with cases that were thoroughly treated by inunctions or injections, in all stages of the disease. The percentage of negative results is perhaps too favorable for mercury, as some of the tests were made after a course of treatment. Omitting three reports that included among the negative results cases in which the reaction was weakened, there were 1,634 cases giving an average of 64.8 per cent. of negative reactions following the use of mercury.

In judging of the serologic action of salvarsan one is struck by the great discrepancies in the results of different observers, particularly in the case of subcutaneous and intramuscular injections. I have tabulated the results of thirteen observers who treated a total of 987 cases by these methods with an average of 47.4 per cent. of negative results. The variations in the results are seen by glancing at Table 2, in which Schreiber and Hoppe reported 92.3 per cent., Lange 61 per cent., Treupel and Levi 25 per cent. and Goldenberg and Kaliski 8.8 per cent. of negative reactions.

The results obtained by intravenous injections, especially when repeated or combined with intramuscular injections, are much more favorable. By the use of triple intravenous injections Gutmann obtained 74 per cent. of negative results, while Zimmern found 68 per cent. after two or more injections. By a combination of intravenous and intramuscular injections Linser obtained 70 per cent. and Micheli and Quarelli 86 per cent. of negative results, while from this method Spiethoff states that a negative reaction was obtained in a majority of his cases.

In a serologic comparison of the different methods of administration of salvarsan, McIntosh and Fieldes found 80 per cent. of negative results after intravenous injec-

* Because of lack of space this article is abbreviated in THE JOURNAL by the omission of the bibliography. The complete article appears in the Transactions of the Section and in the author's reprints.

* Read in the Symposium on Mercury and Salvarsan in the Treatment of Syphilis in the Sections on Pathology and Physiology and Dermatology of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

tions, as opposed to 53 per cent. after intramuscular injections. On the other hand, Craig in a comprehensive paper states that he obtained 78.6 per cent. of negative reactions after intramuscular injections (mostly single), as opposed to 63.8 per cent. after combined intramuscular and intravenous methods.

The value of the reports on salvarsan that have been quoted is lessened by the fact that the period of observation of the cases was short as a rule, seldom more than a few months at best. One of the most valuable communications from the standpoint of the number of cases as well as duration of observation has recently been published by Heidingsfeld, whose latest statistics I am able to quote through the kindness of a personal communication. In his series of 333 cases, treated mostly by single injections, 256, or 76.9 per cent., changed from a positive to a negative reaction. Of these cases 101 remained negative one year or more, fifty-eight, nine months or more, forty-five, six months or more, fifty, from one to three months, giving a total average of eight and one-fifth months per negative case.

From the figures of the different observers that have been thus far quoted it is, I think, apparent that no positive conclusions can be made as to the comparative serologic value of mercury and salvarsan. The case is entirely different with regard to the results recently reported from the abortive method of treatment by salvarsan alone or in combination with mercury. From this method of treatment some very strikingly good results have been obtained from a serologic as well as a clinical point of view.

By the early administration of mercury, it has generally been found to be impossible to abort syphilis if we except the almost immediate application of the drug (first eight hours) at the site of inoculation. Even when the early administration is combined with excision of the chancre, the eradication of the disease does not follow. While such early treatment probably shortens the course of the disease, it is nevertheless true that the subsequent use of the drug is almost invariably required.

While it is too early to judge of the permanent results of abortive treatment by salvarsan it can be asserted that they are at least very hopeful and worthy of our most careful consideration. One of the first reports on the abortive method by the use of salvarsan was that of Finger, who treated thirteen cases of primary syphilis by a single intramuscular or subcutaneous injection. During an observation period of twelve weeks to six months, six cases remained or became Wassermann negative.

In a series of twenty-three cases of primary syphilis treated by Milian by two to four injections (intravenous alone or combined with intramuscular), seventeen cases became negative and remained so from two to eight months and showed no clinical manifestations during this time. Milian writes, "It is certain that these statistics show that salvarsan is not a constant abortive remedy, but that among such remedies it is at the present time the most efficacious and powerful."

Of twenty-one cases treated by Emery by three intravenous injections thirteen became negative and remained so for a period of three weeks to two and a half months.

McDonagh treated twenty-two cases by two intravenous injections at intervals of ten days and writes, "I have twenty-two cases of primary syphilis treated in this way, ranging from twelve months to the present time, which have never given a positive Wassermann reaction or developed secondary symptoms."

Géronne and Gutmann report a series of thirty-seven cases, seventeen of which were positive and twenty negative before treatment. The abortive method was successful in twenty-nine cases, the majority of the patients being observed over six months. Ten cases were under observation from twelve to sixteen months.

Of fourteen cases treated by Stern, eight remained negative and showed no clinical symptoms for periods varying from four to fourteen months.

Queyrat reports a series of seventy-eight cases treated by three intravenous injections at intervals of seven days. He found that fifty-one cases became negative and remained so for periods averaging about three months. None of them showed any clinical manifestations.

Favorable as some of these reports appear, it would seem that still better results in the abortive treatment are possible when salvarsan is combined with mercury. In a valuable communication Gennerich reports on eighty-three cases of primary syphilis treated by intravenous injections of salvarsan combined with injections of calomel. The calomel was given as soon as the diagnosis was made by finding the spirochetes. This was followed in one or two days by intravenous injections of salvarsan given at intervals of a few days, in some cases six injections being given. Of sixty-three cases which were negative at the beginning of treatment, all except four remained negative. Of twenty cases that were positive before treatment all except four became negative and remained so. The figures of Gennerich are especially valuable owing to the comparatively long time of observation, thirty-seven of the cases having been followed for six months to a year and twenty of the cases for more than one year.

Löwenberg treated twenty-four cases of primary syphilis by a combination of two intravenous injections of salvarsan and a course of mercurial inunctions. All of his cases remained Wassermann-negative and free from symptoms at the end of a minimum period of six weeks' observation.

Equally good results were obtained by Arning in the treatment of forty-five cases of primary syphilis and twenty-six cases showing the earliest secondaries, in which the average period of observation was four months, the longest being eleven months. His method consisted of a course of inunctions combined with an intramuscular and, ten days later, an intravenous injection of salvarsan. All of his seventy-one cases showed negative reactions and freedom from symptoms at the last period of observation.

Finally, Hecht has treated cases of primary syphilis by a course of mercurial inunctions combined with two intravenous injections of salvarsan, together with excision of the chancre (in a few favorable cases). Of fifteen cases that were Wassermann-negative at the outset, all except one remained negative during a period varying from four to eleven months.

Before giving the conclusions of my statistical paper, it should be said that in a serologic comparison of the two drugs, salvarsan is perhaps at a disadvantage. While a great deal of experimental work has already been done with this new remedy, the last word still remains to be said as to the best method of administration We do not know as yet the limit of the number of doses that can be given. In the case of mercury, on the other hand, there is a fairly general agreement as to the best form of treatment.

TABLE 1.—CASES OF SYPHILIS TREATED WITH MERCURY

No.	Name	No. of Cases	Method of Treatment	Percentage of Negative Results
1	Müller	48		37.5
2	Lederman	92	One to three courses	26
		59	Four or more courses	52
3	Bering	69	Well-treated chronic intermittent method	84
4	Citron	58		46.5, 75.8 including weak reactions.
5	Fischer	62		48
6	Blumenthal and Roscher	93	One to five "Kuren"	51 negative or weakened.
7	Lesser	115	Well treated; at least four good "Kuren"	62
8	Blaschko	90		84 negative or weakened.
9	Mauriac	33	Well treated	60
10	Pürckhauer	116	One or more "Kuren"	65
		54	One to four "Kuren"	68.5
11	Höhne	127	Thoroughly treated by injections and inunctions	52
			Calomel	66
12	Jesionek and Meirowsky	216	One to three "Kuren"	45
		130	Four to eight "Kuren"	61
13	Bruck	...		70
14	Harrison	49	Two courses inunctions or injections	22
		69	Six to eight courses	59
15	Seligman and Pinkus	166	One to three "Kuren"	25
		38	Four to ten "Kuren"	55
16	Feuerstein	112		42.8
17	Almkvist	102		70
18	Boas	231	Mercury alone or combined KI, arsenic and quinin	79
19	Gavini	139	Little treatment	23
			Energetic treatment	85
20	Marcus	200	Majority; ten "Kuren" by injections	87
21	Gennerich	124	Calomel injections and inunctions	75

TABLE 2.—CASES OF SYPHILIS TREATED WITH SALVARSAN

No.	Name	No. of Cases	Method of Treatment	Percentage of Negative Results
22	Schreiber and Hoppe	52	Subcutaneous and intramuscular	92.3
23	Neisser and Kuznitzky	100	Intramuscular; small doses	44
24	Fraenkel and Grouven	75	Subcutaneous	9, 24 including weak reactions.
25	Lange	250	Subcutaneous and intramuscular	61
26	Jeanselme and Touraine	32	One large dose (?)	75
27	Lesser, E.	66	Intramuscular	25
28	Plaut	46	Subcutaneous	4, 10.9 including weak reactions.
29	Scholtz, Salzberger and Beck	80	Subcutaneous	26
30	MacRae	54	Subcutaneous and intramuscular	12.9, 29.6 including weak reactions.
31	Weiler	40	Intramuscular	50 became negative or an original negative remained so.
32	Treupel and Levi	115	Subcutaneous and intramuscular	25
33	Freund	43	Mostly subcutaneous	35
34	Goldenberg and Kalski	34	Subcutaneous and intramuscular	8.8; a number also gave weakened reactions later.
35	Noguchi	102	Subcutaneous, intramuscular and intravenous	33.7, 52 including weak reactions.
36	Fox and Trimble	71	Intravenous and intramuscular	39
37	Engman and Buhman	32	Intramuscular and intravenous	28
38	Craig	150	Intramuscular	78.6
		30	Intravenous	53
		36	Combined	63.8
39	McIntosh and Fieldes	26	Intramuscular	53
		21	Intravenous	80
40	Gutmann	27	Three intravenous	74
41	Zimmern	132	Two or more intravenous	68
42	Kromayer	30	Repeated small intravenous	26
43	Linser	135	Repeated intramuscular and intravenous	70
44	Spiethoff	90	Combined intravenous and intramuscular	Negative in majority of cases.
45	Michell and Quarelli	34	Combined intravenous and intramuscular	86
46	Heidingsfeld	333	Mostly intravenous	76.9

TABLE 3.—RESULTS OF ABORTIVE METHOD OF TREATMENT BY SALVARSAN ALONE OR IN COMBINATION WITH MERCURY

No.	Name	No. of Cases	Method of Treatment	Period of Observation	Percentage of Negative Results
47	Finger	13	One intramuscular or intravenous	12 weeks to 6 months	46
48	Millan	23	Two to four intraven. or combined intraven. and intramusc.	2 to 8 months	73.9
49	Emery	15	Three intravenous injections	3 weeks to 2½ months	86.6
50	McDonagh	22	Two intravenous injections	12 months to present	100
51	Géronne and Gutmann	37	Two and three intravenous injections	Majority over 6 mos.; 10 cases from 12-16 mos.	78.3
52	Stern	14		4 to 14 months	57.1
53	Queyrat	78	Three intravenous injections	Average three months	65.3
54	Gennerich	83*	3-6 intravenous injections; 6-12 calomel injections	37 cases ½ to 1 year; 20 cases more than 1 yr.	63.5
55	Löwenberg	24	Two intravenous injections of salvarsan combined with course of mercurial inunctions.	At least six weeks	100
56	Arning	45	One intravenous; one intramuscular injection combined with mercurial inunctions.	Average four months	100
57	Hecht	15†	Two intravenous injections combined with mercurial inunctions.	4-11 months	66.6

* Sixty-three negative at outset; twenty positive at outset. † Negative at outset.

The question of the serologic effect of a combination of the two remedies has not been discussed except in the case of the abortive method, as the reports on this aspect of the subject, though favorable, are yet very few in number.

CONCLUSIONS

1. In the primary stage of syphilis, especially before the Wassermann reaction becomes positive, salvarsan is a most valuable remedy from both the serologic and clinical standpoint.

2. Repeated intravenous injections at this stage give promise of aborting the disease in a considerable percentage of cases.

3. No such promising results have ever been reported by the early administration of mercury alone.

4. It is probable that the abortive method will prove still more effective when a combination of the two drugs is used.

5. A serologic comparison of mercury and salvarsan in later stages of syphilis fails to show any decided advantage in favor of either remedy.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. SWIFT, FORDYCE, POST, NOGUCHI AND FOX

DR. WILLIAM ALLEN PUSEY, Chicago: Salvarsan was introduced as a remedy that was to destroy the infection of syphilis by one massive injection. What has been its history in the two years since then? First, it was given as one large dose of a neutral emulsion; then came the injection of the alkaline solution in the muscle; then the injection into the veins; now we have salvarsan, plus our old reliance, mercury. Taking the drug itself, first we had salvarsan, then salvarsan hyperideal, and, although one might have thought that a drug called hyperideal had reached the acme of its purpose, now we have neosalvarsan. And we have been forced, by the sad accumulation of facts, away from the claim that salvarsan cures syphilis except—to avoid argument—in early favorable cases. The present situation is a far cry from the original idea of *therapia sterilisans magna*, and yet the lurking notion of salvarsan as a cure for syphilis is still responsible for a large part of its use.

These variations from the original proposition as regards salvarsan are not mere refinements in technic. The transformation that has occurred in salvarsan therapy indicates that we are dealing with a drug still in the making, whose action has not proved satisfactory and which has not come up to the original promises made for it.

We may say positively and finally that salvarsan does not cure syphilis in any more cases than mercury does, on the basis of either the physiologic or the clinical test. That is the most important thing that we can preach to the profession at the present time. In the second place, salvarsan is a symptomatic remedy of efficacy. It is one that can be compared with the combination of iodids and mercury. I am not prepared to believe from my own experience that, except in unusual cases, the symptomatic effects of salvarsan are any more pronounced than those of mercury and potassium iodid in combination.

The real problem in syphilis is parasyphilis. The lesions of syphilis we can handle effectively with mercury and the iodids. What of the prognosis as regards the occurrence of parasyphilitic affections of the nervous system in the cases of syphilis treated with salvarsan? Arsenic itself has an especial affinity for nervous tissue and produces degenerative processes in nerves, and no man can now say whether these massive doses of arsenic given as salvarsan are going to diminish parasyphilitic affections of the nervous system or increase them. In salvarsan we have not another antitoxin for diphtheria, but a tuberculin—a thing of use, but a thing still very far from a definite position.

DR. A. G. RYTINA, Baltimore: I am sure that any one who has had experience with salvarsan is convinced of its immediate and wonderful symptomatic efficiency. Anyone who has used it must have treated cases successfully that resisted mercury and potassium iodid. It is also evident that salvarsan has not fulfilled the early hopes of Ehrlich's *therapia sterilisans magna*, as far as syphilis is concerned; but that this idea is not far-fetched has been proved by its effect in abolishing such infections as frambesia, bilharziosis, human and animal recurrent fever, animal syphilis and certain spirillar diseases in animals and fowls. In these affections, members of the same spirochetal family, the organisms are mostly in the circulation, and therefore, at a point of vantage, as far as attack by salvarsan is concerned. There is no doubt in my mind that salvarsan is specific for the *Spirochæta pallida*, but owing to the pathologico-anatomic changes present, namely, the formation of spirochetal rests, often in parts of the body inaccessible to the circulation, the cause of the failure of salvarsan to cure syphilis is explained. In intravenous injections, owing to the rapid elimination, some organisms escape; these later generate a new progeny, which, escaping into other parts of the body, produce again symptoms comprised under the term "recurrence." On this account I have been of the opinion for a long time, that until salvarsan or some similar drug was modified, so that we could get a prolonged and protracted action, we could not expect a larger percentage of cures. Intramuscular injections of salvarsan, according to Ehrlich and others, are more efficacious but on account of the excruciating pain, abscess formation, etc., have never met with favor.

Within the last four or five weeks I have been experimenting with neosalvarsan, which on account of its neutralness and high solubility lends itself more readily to intramuscular injections, thereby allowing a more prolonged and protracted action. The symptomatic results with neosalvarsan are just as good, if not better than with salvarsan, the constitutional reactions practically *nil* and the pain and local changes, which consist either of an induration or an elastic edema, are decidedly less severe.

Our technic is to give preferably three or four intramuscular injections of 0.9 gm. neosalvarsan at weekly intervals except in the very early cases in which a more intensive action is required. Up to the present time we have not noted any local or general complications.

DR. E. G. BALLENGER, Atlanta, Ga.: During the past eighteen months I have been using salvarsan. I have given 693 injections, mostly intravenous, to 308 patients. These patients are now in better physical condition and freer from evidences of syphilis than any similar group of patients whom I have treated with mercury and potassium iodid. I have continued to use this remedy because the patients thrive on it. The recurrences were less frequent than before; and I shall continue to use it as long as the patients do well. I have given 153 injections of neosalvarsan to fifty-four patients, who have done remarkably well. I have noticed very slight disturbances, and have given intravenous injections every other day, until three or four injections have been given. At the end of the month, two or three injections more are given; and I shall repeat them when needed. I supplement the treatment, when necessary, with mercury.

I have made a slight modification in the technic. In introducing the needle, I push a stiletto, like that used in embroidery, into the skin over the vein, which gives me a little window. By pushing straight down on the needle until it engages the wall of the vein, and then pushing along parallel with the vein, the needle may then be easily inserted accurately through the anterior wall in the lumen of the vein without dissecting the latter out, and with so much accuracy that the patient does not complain of pain afterward. We have given more than 500 consecutive injections, without an incision to expose the vein or cut it out. It is well to do these repeated injections expeditiously and painlessly so that the patients will willingly return for the necessary subsequent treatment. We have evolved several methods of entering the vein, but this one, I think, simplifies the procedure more than any before used.

DR. JUDSON DALAND, Philadelphia: We must all recollect that Ehrlich is not a physician, and does not see syphilis in the human individual. His own experience was practically limited to syphilis in animals; and he was able absolutely to sterilize the rabbit in a period of twenty-four hours. It was his hope that this would prove to be true so far as syphilis in the human family was concerned. In consequence of this statement, which has been misunderstood, there was in the beginning an extraordinary expectation that any syphilitic patient who received a proper dose would promptly recover; and, therefore, a large number of men are at present disappointed.

With reference to the statements regarding the abortive treatment of syphilis, it seems to me that in this particular form, this drug promises most; and it does seem to me that the statistics already given regarding the serum reaction and other evidences tend to show that it has been of very valuable service in this form, which is the easiest to relieve. In the treatment of primary syphilis, it is desirable that the chancre shall be removed, not so much with the idea of excising all the disease as of excising as much tissue as is known to contain the *Spirochæta pallida*. Then, the introduction of salvarsan, combined with mercury, if desired, promises the best results.

From the very beginning Ehrlich has urged the probable necessity of the use of both mercury and salvarsan in the treatment of syphilis. So far as late manifestations are concerned, we find that salvarsan usually exerts, especially in paresis, very little effect. In other words, a strongly positive Wassermann reaction is not materially influenced; nor are the symptoms especially influenced, as a rule. There are cases that show the marvelous rapidity of the action of the drug, so that often some of the vital structures are saved, which could not have been saved if mercury had been employed. Salvarsan is an additional drug, and is not intended to displace mercury, but to act in combination with it. There is no rivalry in the use of the two drugs. It is to be determined whether to use them singly or combined. Salvarsan has made for itself a place that I believe to be permanent; I think it should be used intravenously, thus making it possible to determine exactly the dosage. In this method also it is distributed best throughout the body. The intramuscular injections give an unknown quantity in the blood. A certain definite dosage is necessary for it to exert its action. Therefore, intramuscular doses are less valuable than intravenous doses.

DR. RICHARD L. SUTTON, Kansas City, Mo.: While I agree with the majority regarding the great value of salvarsan as a therapeutic agent, I also represent one of a rather thoughtful minority who appreciate the enormous risk involved when the drug is used intravenously. During the past twelve months, I have seen in the practices of other men four cases of hemorrhagic encephalitis which I feel sure were due to salvarsan, and not to syphilis. In two of these instances, freshly distilled water was employed, so the claim that bacteria in the diluting fluid was the cause can safely be ignored. Three of the patients were men who presented no other evidence of disease except syphilis, and every possible precaution was taken to prevent accident, yet the patients were dead in from two to ten days afterward.

When men of the scientific standing of Ehrlich and Craig acknowledge the greater therapeutic value of the intramuscular method as compared with the intravenous, the only objection to the former being the slight amount of pain following injection, we must admit that it is at present the only way in which we are justified in administering the remedy. If the drug is properly mixed, the resulting pain is very slight, and the after-effects are much better than when intravenous injections are given. In a condition like syphilis, in which we have other and very dependable remedies, we have no right to experiment with the lives of our patients.

DR. B. C. CORBUS, Chicago: The biologic control in the treatment of syphilis depends on two things: first, the time at which the patient comes under observation; and second, the amount of previous treatment the patient has had, whether with mercury alone or salvarsan alone, or by the combined method. To be able to make the diagnosis early is to have the cure readily within our grasp. Where it took years before, it now takes only a few months to effect a cure when the diagnosis is made from the primary lesion before the Wassermann is positive. There should be no stereotyped way of administering salvarsan. Each case should be a law unto itself. The prevailing opinion seems to be that the patient is cured when we get the first negative Wassermann. Nothing is said in regard to treatment after that. Most of our observers stop here. We have only just begun to find out that we must continue our treatment energetically under this condition, if we wish a successful cure.

Four years ago, I began treating syphilis with mercury after the biologic method; I have patients with primary and secondary syphilis who are biologically and clinically well, and it is two years since the last treatment was administered. We are all agreed that with the combined method, we have a much quicker way of treating the disease; but I think that the time when the case comes under observation should play a rôle in the selection of the kind of treatment it is to receive.

I began treating patients in October, 1910, with the alkaline intramuscular injections after the Alt-Lesser technic, and some of the patients whom I have had under observation since that time have remained biologically and clinically well with two injections given six weeks apart.

The treatment of syphilis at present should be with both salvarsan and mercury when the patient comes under observation early. An intravenous injection should be given first, followed in four days by an intramuscular injection. This should be followed by a course of rubbings, at least fifty to seventy-five, preferably one hundred, and later, by at least two intravenous injections of salvarsan.

In early secondaries, the treatment should be the same as in the later. In later secondaries (after the second month) two intramuscular injections first, then all subsequent treatment intravenously, combined with vigorous mercury treatment, preferably rubbings.

In latent syphilis and in parasyphilitic conditions, unless the condition is urgent, I prefer to administer potassium iodid and mercury before the employment of salvarsan.

CAPT. H. J. NICHOLS, Washington, D. C.: We in the Army have been very much interested in salvarsan, and believe that it has justified itself by its immediate effects. I think, too, that the era of salvarsan has raised the question of the cure of syphilis, and thrown on it a light that we have never had before. For example, in the British army it has been the custom to give two years' treatment with gray oil, averaging twenty-eight injections. The patient was then considered cured. Since the Wassermann reaction has been introduced and some of these cases have been followed by means of that reaction, it has been found that at the end of two years 40 per cent. of these patients still had a positive reaction, and a still larger percentage must remain infected. Salvarsan, in rapidly bringing about a negative Wassermann, even if it recurs, has reopened the question of the cure of syphilis, and has really led us along right lines toward securing it.

Dr. Pusey has written, I believe, in the last year or so, that nothing was lost by allowing a patient with a primary lesion to develop secondary ones. Such an opinion can be held, of course; but this is not the best opinion on the subject; the same is true, in my opinion, of his general attitude toward the drug.

I think that in this discussion we should not lose sight of Dr. Noguchi's paper, in which he showed that he could cultivate spirochetes from granules. Now if this is developed, it certainly will have some clinical bearing; perhaps it may lead into an explanation of the relation between paresis and tabes and syphilis. At present, if you ask any neurologist or psychiatrist the relation between syphilis and paresis, he has no satisfactory answer to give. He says that syphilis must come before either of these diseases, but spirochetes have never been found in tabes or paresis. What the relation is, he does not know; it may be possible that there are spirochetes present in paresis and tabes in the form of granules which are making the trouble.

DR. M. L. RAVITCH, Louisville, Ky.: If I understand correctly, Captain Nichols criticizes the older writers for their stand that the chancre should be enucleated, preventing thereby the secondary stage with its concomitant eruption. To my mind, the theory of the older writers is very plausible. No doubt the chancre is the initial trouble and it was wisely called the initial sore. Going into the detail of etiology of syphilis, we may sum up the process in this way: The patient was exposed to syphilis. The spirochetes were lodged, let us say, on the highly sensitized skin of a certain organ. The spirochetes constituting a foreign protein and an irritant to the skin, Nature tries her best to throw them off by means of serums and other fluids. Sometimes the battle is successful; the doors are successfully barred against the entrance of the spirochetes into the general circulation. Sometimes Nature fails to kill the spirochetes in the chancre with the aid of protective fluids. Then, the spirochetes go deeper, are absorbed by the lymphatics and blood-vessels, and a general infection is the result. Nature then makes her second effort and sends out more protective fluids; we have then the secondary or eruptive stage. Nature fails; the system becomes sensitized. Nature not being able to help the patient, the latter comes to the medical man. Chemical means are applied. Mercury and arsenic are used, the latter in the new form of salvarsan. But salvarsan is not really a new remedy. Arsenic was used by the same old writers who advocated enucleation of the chancre. No doubt both mercury and salvarsan are good remedies. The first is undoubtedly a specific if used rightly. The latter is a good adjunct and can be used in obscure cases, particularly when mercury cannot reach the latent spirochetes. Sometimes neither remedy completely eradicates the disease. Like the gonococci in gonorrhea, the spirochetes in syphilis may also assume a latent form, and when the body becomes weakened, they may revive and become active again, causing a new eruption. Some writers may assert that the patient has become reinfected; but this is not so. The point I want to make is that the old writers were fully justified in advocating enucleation of the chancre and that salvarsan or arsenic is not a new remedy. Nothing is new in this world.

DR. HIDEYO NOGUCHI, New York: I forgot to express my views about the cycle in the life of the spirochete. It is first bred very near home; and it will go around in the spiral form near home as long as the condition of the environment remains unfavorable, but not dying out. Then, when the condition of the environment improves, the spiral forms sprout and form these granules, which afterward grow into normal-sized spirochetes. That is the time of life and the stage in which one finds the spirochetes in the primary stage of the disease. This stage may last a year or longer. The immunity reaction of the body then becomes so marked as to restrain the growth of the spirochetes. The unfavorable condition persists, and it may force the spirochetes into the sporulation form. Of course, this is all only speculation, based on the findings in the pure cultures. All the forms of which I have spoken can be demonstrated, however; yet, to be sure, we have to have clinical conditions also bearing on this point. The study of latent syphilis is interesting in connection with the various forms of spirochetes found.

DR. HOMER F. SWIFT, New York: A case of optic atrophy which began about ten months after an intramuscular injection of an oily suspension of the drug caused us to abandon the intramuscular use of salvarsan. The atrophy was arrested immediately on removal of the necrotic area at the site of the injection. Investigation of the rate of absorption of arsenic from the site of intramuscular injections in rabbits showed that the absorption was so slow that ten weeks after the injection between 5 and 20 per cent. of the arsenic still remained in the muscle. There was extensive necrosis at the site of all the injections. With neosalvarsan there is a necrosis having a similar gross appearance. Until we know that the rate of absorption from intramuscular injections is quite rapid we should probably continue the intravenous injections of neosalvarsan.

DR. JOHN A. FORDYCE, New York: I have had more or less to do with the treatment of syphilis during the past thirty years. I can truthfully say that in the last two years I have seen more patients restored to health by salvarsan alone or combined with mercury than in all of my previous experience. The drug is unquestionably a specific spirochetal poison and when administered early in the disease in doses sufficiently large it will abort a certain percentage of cases of syphilis. If it does not destroy all of the spirochetes it is because they are not reached by it. In such cases an intermittent form of treatment with a combination of salvarsan and mercury is necessary to eradicate the infection. The drug materially shortens the period of treatment of the disease and heals the contagious lesions within forty-eight hours to a week. In the City Hospital with which I am connected such patients were formerly treated for months in many cases with persistence of the contagious lesions. They would frequently leave the hospital with contagious sores and become a menace to those around them. If the drug does nothing more than limit the infectiousness of these individuals it is an exceedingly important addition to therapeutics. In regard to the danger of intravenous treatment I have given over 1,000 such injections and have never seen any serious symptoms except in one case. Since the improvement in the technic by the use of fresh distilled water the intravenous injection of salvarsan is practically as safe as an intramuscular injection of mercury.

Another point I wish to protest against is the indiscriminate cutting down on the veins in order to administer the drug. In the great majority of cases this is absolutely unnecessary as the veins can usually be rendered visible or can be felt and the needle introduced with little trouble. In my experience during the past two years I have not in a single instance found it necessary to resort to this procedure. Frequently, after the veins have been cut down on, they are obliterated and it is exceedingly difficult to administer subsequent injections to these patients. Furthermore it marks the patient for life and indicates to the trained observer the nature of the treatment which the patient has received.

THE TEACHING OF SYPHILIS

THE ATTITUDE OF HOSPITAL BOARDS TO THIS DISEASE *

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In the evolution of the American medical college it has been necessary from time to time to call attention to the object for which the medical school exists. Primarily, in training men to supply the need of a rugged and rapidly increasing population, medical colleges sprang up until their number became excessive, and the quality of instruction furnished failed to keep pace with the demand. At that time, as in the beginning, those who desired to pursue advanced study were compelled to seek such training in the medical centers of Europe. With but few exceptions such was the condition previous to the beginning of the present decade.

The first change in the primitive régime was in the development of the laboratory. This involved an expenditure of money that wrought a double benefit, for it not only improved the curriculum but rendered medical schools unprofitable and consequently impossible as a private business enterprise.

With the medical school on a university basis, and with the necessary endowment, while no one would wish to belittle the importance of the laboratory, for it furnishes the very foundation to medical training, yet, the time has now arrived when careful attention should

* Read in the Section on Dermatology of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

likewise be given the clinical chairs. Heretofore, in many schools, this has been impossible on account of insufficient endowment, but in the future, clinical chairs must be placed on a teaching basis, with sufficient endowment to secure and encourage the best a competent teacher has to give.

The present need of medical education in this country is: (a) the training of men to become general practitioners of medicine, in other words, the making of competent family doctors; (b) the fitting of men for special fields of work.

The student primarily should be taught the essentials of medicine, and if at this stage he elect to take up a general practice he should also be taught the limitations to which he can safely go for the best interests of his patients and his own reputation. It is in this primary school of medicine, the output of which is the general practitioner, that much that is now taught should be eliminated from the primary grade, while other subjects, now neglected or inadequately taught, should be more thoroughly dwelt on.

The medical man may not at first be called on for any of the more difficult surgical procedures; even should opportunities for such work occur, good judgment would restrain him, for without special postgraduate training for this work his reputation as well as the life of his patients would suffer the utmost peril. He is, however, liable to encounter the initial lesion of syphilis. Here the merest tyro in medicine feels himself competent. Mistakes made, while not so immediately appalling, nor so apparent as in the former instance, are of the gravest moment, for on his knowledge depends the welfare, if not the life, of the patient as well as those with whom he may be associated by family or other ties. It is now conceded that during the first few months more can be done toward eradicating the disease than at any other period. The practitioner, therefore, should be competent to recognize the affection—should be fully cognizant of its gravity and the most approved methods of treatment of this very common and very important affection—important to the patient as well as to the community in which he lives.

During a long course as medical teacher I have repeatedly had occasion to note the lack of exact knowledge of syphilis possessed by candidates for graduation or hospital appointment. The cause may be traced primarily to the curriculum and the absence of correlation among teachers. Not only should the closest relation be encouraged between the laboratory and the clinic, but a more exact correlation should exist among the clinical teachers of a medical college. In no subject is this need more apparent than in the teaching of syphilis. Previous to the present decade there might have been some excuse for the random and inefficient manner in which this affection was taught in the medical schools of this country, but since Schaudinn and Hoffmann discovered the active agent of syphilis and its ease of demonstration, since Wassermann pointed out some of the possibilities of the serum test in determining the presence or absence of syphilis in a given case and since Ehrlich led the way to its more rapid extinction, there is need of more thoroughly trained teachers to instruct the student in this disease.

In 1889 the Western Reserve University established a chair of diseases of the skin and syphilis, and while systematic instruction was given in syphilis, it was nevertheless hampered by the haphazard distribution of clinical material.

In the distribution of cases in most hospitals and clinics syphilis is sent to one department or another, according as the most noticeable symptom is on the skin, in the brain, the eye or the internal viscera. Even the genito-urinary surgeon in some instances claims it as his own. This was the custom at Lakeside Hospital previous to the present year, with the result that patients were discharged "cured" after the special organ involved was restored to its normal condition. Again, students were confused on account of the multiplicity of teachers and obtained no thorough or systematic conception of the disease. Furthermore, the large percentage of reentries for "relapse" demonstrated most forcibly the inadequacy of the system and the harm it was doing both to the patient and to the student.

Since the beginning of the present year the following rule has been adopted at the out-patient department of Lakeside Hospital: On entering, or as soon thereafter as the disease is recognized as syphilis, the case is sent to the department of skin diseases and syphilis. In case particular organs, as the eye, require more specialized treatment the case is referred to the eye department, which in turn returns it after completing such special treatment to the regular department for further systematic treatment or discharge. The results thus far have shown a marked improvement in the treatment and teaching of this disease.

In place of the lack of interest in transitory patients who came only sufficiently long to be temporarily relieved, a high percentage of patients now remain until discharged, and many return when requested, for further observation. The difficulty heretofore, as at present, is that many of the departments are manned by men in general practice, who give this time in exchange for such experience or patients as they may be able to acquire. Since the appointment of an executive officer who is a medical man and who superintends the distribution of clinical material, the out-patient service has been more and more satisfactory and better results are obtained to both patient and student than was previously found possible.

HOSPITAL PROVISION FOR SYPHILIS

Most hospitals not only make no provision for syphilis but refuse patients who seek admission for this disease. In the City of Cleveland only one hospital receives syphilitics, the City or Municipal Hospital; at the same time, in all hospitals there is a very high percentage of syphilitics admitted, because the disease is not recognized and because the patients, admitted for other affections, are found to be also syphilitic. This applies to all departments with about equal frequency. Even orderlies and nurses employed by the hospital have been found to be in the most active stage of the affliction. More danger is encountered in these random, unknown cases than when special wards are provided and proper precautions are observed in their management. Moreover, it demonstrates the utter futility of attempting their complete exclusion. Formerly the need was less urgent for such accommodation than at present. With the treatment by salvarsan it is indispensable to have such patients admitted to the hospital for short periods. Prompt measures at the onset will prevent the danger that always exists to others, and affords the most favorable opportunity of eradicating the disease from the patient's system. In all hospitals, therefore, a male and a female ward should be established for syphilis. In this regard, boards of management and superintendents should be better informed concerning the frequency and

the gravity of syphilis and the relation which the disease bears to the general community.

The mistake has arisen in looking on syphilis as a disease confined to the low and vile, while in reality it is encountered in all grades of the moral and social scale; furthermore, the number of blameless persons afflicted with this affection is remarkably high. If special provision were made, there would be far less likelihood of such cases being scattered promiscuously through the various services of a hospital as now occurs under the rule of exclusion, which is wholly theoretic, for in actual practice it does not exclude. Nor should these cases be excluded.

CONCLUSIONS

From the foregoing it seems evident that syphilis should be taught by the creation of a special department; that so far as possible all phases and forms of the affection should be taught in, or at least be under, the supervision of this department; that laboratory facilities should be furnished and manned by a competently trained staff, and that hospital provision is imperative both in better treating the disease and guarding the safety to others in the institution. The good such an arrangement would do would redound to the credit of the hospital and tend to safeguard the community in which the hospital is situated.

If it is inexpedient to establish a special chair or department of syphilis the disease should be grouped with diseases of the skin, because most commonly the lesions of syphilis are found on the skin and an interpretation of these lesions is best entrusted to the trained eye of the dermatologist. In conclusion, he is best equipped to treat skin lesions who, in addition to being trained in the field of general medicine, becomes skilled in observation with the ability to interpret. With the rapid development of serology and other laboratory departments, to be skilled in a given field one must, after the general foundation has been securely established, specialize in order to attain that proficiency which concentration alone can give.

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ABSTRACT OF DISCUSSION

DR. ABNER POST, Boston: The idea that the teacher of syphilis has done his duty when he treats syphilis as a neural disease is passing away. Syphilis is recognized as a constitutional disease which involves the whole body. To teach syphilis properly the teacher must have aid from his colleagues. Dr. Corlett's suggestions as to the way in which such cooperation should be brought about deserve serious attention.

It is a serious question how much a teacher of syphilis should be expected to teach his students. He does not need to make syphilographers of them but he should be able to impress on them the general attributes of the disease, so that whether they practice on the eye or the ear or the internal organs they may recognize obvious symptoms outside of their own branch. We are most of us obliged to depend on ambulatory service and it ought to be possible by some cooperation to connect the cases in the wards with the ambulants.

DR. JOHN A. FORDYCE, New York: There should be a department of syphilography in our medical schools which should teach in an intensive manner the general pathology and symptomatology of the disease, so that a student could obtain from one department a general knowledge of syphilis of the skin, viscera, blood-vessels and the nervous system. I do not intend to convey the idea that one man should cover the entire subject of syphilis. The finer points in the diagnosis of syphilis aside from the skin and mucous membrane lesions should be taught by the department of medicine, surgery, neurology and ophthalmology. The department of syphilis should have under its control a Wassermann laboratory, as at the present time it is impossible to diagnose and treat many of the manifestations of the disease without a proper serologic control. The diagnosis of syphilis should be made as early as possible and when there is any question of doubt the dark field should be employed to clear up the diagnosis. It is only by an early recognition of the infection that the abortive treatment by modern methods can be successfully carried out.

DR. WILLIAM A. PUSEY, Chicago: About two years ago I served as chairman of a subcommittee which was appointed for the purpose of suggesting a practical working plan for the teaching of dermatology in the medical schools and the time that should be given to it in the curriculum. I was put in the unpleasant position of objecting to the number of hours that almost every other department declared it required. When it came to the department of dermatology, I expected the same objection from others, and very much to my surprise I found an opposite attitude; they agreed that dermatology and syphilis were entitled to liberal consideration. This experience has led me to believe that if we work in reasonable concert along the lines Dr. Corlett has suggested, we might be able to obtain very practical results in a few years.

DR. HENRY C. BAUM, Syracuse: To every one who teaches this subject, there can be but one opinion in regard to the advisability of carrying out the suggestions made by Dr. Corlett, and in order that something definite may be accomplished, I would suggest that Dr. White appoint a committee to draft regulations which may be submitted to the institution in which syphilis is taught, and which would give to them the weight of the opinion of this Section on this subject, the committee to report at the next annual meeting of this Section.

DR. GEORGE H. FOX, New York: We must approach the study of syphilis from various points of view, and the man who teaches syphilis should not only understand the cutaneous lesions of the disease, but also syphilis of the eye, throat, nervous system, etc. Most of those teaching this subject are compelled to limit instruction to the cutaneous symptoms, and I believe that one of the best ways to simplify it for students is to use the same terms in describing the skin lesions. As it is now, we employ terms carelessly in referring to the cutaneous manifestations of syphilis. Two weeks ago, at a meeting of the American Dermatological Association in St. Louis, I read a paper calling attention to this fact, and suggested a scheme for simplifying the nomenclature of cutaneous syphilis to take the place of the confusing and often inaccurate classification that is found in many of our text-books.

DR. ISADORE DYER, New Orleans: I think the idea of relegating the teaching of syphilis in our medical schools to any one man is not practicable at this time. There are comparatively few men who possess such a special knowledge of the subject as to be able to cover the dermatologic, ophthalmologic, rhinologic, neurologic and other phases of the subject. There are comparatively few men who occupy chairs in dermatology who are properly qualified to teach syphilis as it should be taught. Under our present system of teaching syphilis, the students receive a certain amount of instruction regarding it from the various chairs of medicine, surgery and the specialties, but the information is not at all crystallized. At the Tulane University we have tried to cooperate in this respect, so that when the professor of medicine reaches a certain point in the teaching of syphilis, he calls in the various specialists to give a course of lectures on the subject in their special branches. As it is, the students obtain their knowledge of the subject from too many different sources, and what is needed is further cooperation. Syphilis should be given as much prominence as any other subject in the teaching curriculum.

DR. JAMES M. WINFIELD, Brooklyn: At the Long Island College Hospital we have been trying an experiment somewhat similar to that outlined by Dr. Dyer. We found that students were receiving a great deal of instruction in regard to syphilis in a rather haphazard way, so the professor on genito-urinary diseases agreed to join with me in an effort to supervise the teaching of syphilis. He limits himself to the etiology, pathology and the primary lesion, and then I follow with a course of lectures on the cutaneous manifestations of the disease. Then the internist, the neurologist, and the various

other specialists take up the subject, limiting themselves to their particular branch, one immediately following the other. Thus far the plan has worked wonderfully well.

DR. W. T. CORLETT, Cleveland: I believe syphilis will be better taught in the future than in the past, and while individual opinions may differ as to the best way to attain this end, yet correlation and concentration, which will confine as much as possible the fundamentals to an individual department, will do much to disseminate a better and more definite understanding of the affection among medical men.

THE INTENSIVE TREATMENT OF SYPHILIS *

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AND
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The numerous contributions to the study of syphilis in recent years have confirmed in many points the previous observations of a purely clinical nature; along other lines they have settled mooted questions, but they have caused the previous views in regard to treatment to be largely revised.

The Wassermann reaction has been in use long enough to establish its place definitely as an indicator of efficient treatment. While a single negative reaction does not mean that the patient is cured, a positive reaction certainly indicates the presence of spirochetes in some part of the body. In a previous communication one of us[1] has called attention to the proportion of positive reactions in latent syphilis, and its relation to the intensity of treatment as carried out in this country. In cases of latent syphilis, within three years of the time of infection, 75 per cent. showed a positive reaction. In late latent cases with two years' treatment or less, 58 per cent. of the reactions were positive, while 40 per cent. of the patients who had taken from two and one-half to six years' treatment still gave a positive reaction. In Paris, Levaditi and Latapie[2] found 44 per cent. positive reactions in late cases which had received intensive mercurial treatment. Lesser[3] concluded that four courses of mercury represent the maximum of efficiency, because in the late latent stage he obtained 54 per cent. negative reactions in patients who had undergone four courses, while only 53 per cent. of those patients who had taken six courses gave negative reactions. Jesionek and Meirowsky,[4] however, found that although 41 per cent. of patients who had taken four or five courses of treatment gave positive reactions, the figures fell steadily to 31 per cent. for those who had undergone eight or more courses. With the rule for chronic intermittent treatment laid down by Neisser, namely, six courses of mercury in the first three years, the figures still show the presence of positive reactions in over one-third of all patients who had taken three or more years of treatment. In the above-mentioned figures, the conclusions are drawn from single tests and, considering the tendency of the reaction to relapse when treatment is discontinued, it is probably safe to conclude that 50 per cent. of all patients with syphilis were insufficiently treated. Autopsy[5] findings on subjects, who had a history of previous syphilis and on section showed some visceral lesion, confirm this view.

The advantages of an early diagnosis of syphilis can hardly be overestimated. From the standpoint of the protection of the community, the early diagnosis and hence early treatment decrease the danger of the spread of the disease. The secondary period with its mucous patches and moist condylomas is the most infectious, and the prevention of such lesions will, in a large part, prevent the spread of syphilis.

Of still more importance to the patient is the recognition of the life-history of syphilis. It starts as a local infection and, according to the degree of local reaction and activity of the virus, remains localized for a longer or shorter period. After the spirochetes have broken through the first line of defenses, there is a general invasion of the body. The dissemination of the spirochetes doubtless takes place largely through the blood-stream during the last half of the primary stage and in the early secondary period. During this time the blood is most often found to be infectious. With the blood from a patient at least three weeks before the outbreak of the secondaries, Hoffmann[6] was able to induce a typical initial lesion in monkeys. Fruhwald,[7] in an extensive review of the infectiousness of the blood, states that with one exception spirochetes have never been demonstrated in the blood, either by direct examination or by animal inoculation, later than the first six months of the disease.

ACTION OF THE SPIROCHETE

The knowledge of the early general distribution of the virus gives one an entirely new conception of the progress of the disease. It is probable that all of the tissues are inoculated early, and relapses are simply relapses *in situ*. The progression of the cutaneous manifestations supports this view. The lesions are at first almost universal and very superficial, but with each relapse they become more localized, and tend to group and involve deeper structures until the gummatous stage is reached. These very localized relapses probably are excited by spirochetes long present in the tissues, which the general defenses of the body or therapeutic measures have been unable to destroy and which the local reactions are endeavoring to conquer. It is well established, in both human and experimental syphilis, that spirochetes can lie dormant in tissues for long periods without giving rise to any inflammatory reaction. Spirochetes have been found in various tissues of the body which have never shown any evidence of the disease, and which at the time of examination showed no tissue reaction. The Herxheimer reactions, which occur shortly after treatment, are often noted in areas where no gross lesion could be demonstrated. If this reaction is considered as due to the liberation of toxin from spirochetes present at the site of the reaction, it indicates the probability of such a latent condition of the microorganisms.

The involvement of the central nervous system has always been one of the most important features of syphilis, but only lately are we beginning to realize how early this involvement occurs. With the spinal fluid of a patient in the very early secondary stage and without nervous symptoms, Hoffmann[8] was able to produce syphilis in a monkey. Ravaut[9] found an increase in cell-count in 67 per cent. of 116 patients with early secondary syphilis. In parts of the nervous system

* Read in the Section on Practice of Medicine of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

* From the Hospital of the Rockefeller Institute for Medical Research, New York.

1. Swift, H. F.: Arch. Int. Med., 1910, vi, 626.
2. Levaditi and Latapie: Presse méd., 1911, xix, 889.
3. Lesser, F.: Deutsch. med. Wchnschr., 1910, xxxvi, 116.
4. Jesionek and Meirowsky: München. med. Wchnschr., 1909, lvi, 2297.
5. Lesser, F.: Deutsch. med. Wchnschr., 1909, xxxv, 379
6. Hoffmann, E.: Deutsch. med. Wchnschr., 1906, xxxii, 496.
7. Fruhwald, R.: Wien. klin. Wchnschr., 1912, xxv, 584.
8. Hoffmann, E.: Deutsch. med. Wchnschr., 1912, xxxviii, 313.
9. Ravaut: Ann. de dermat. et de syph., 1903, p. 537.

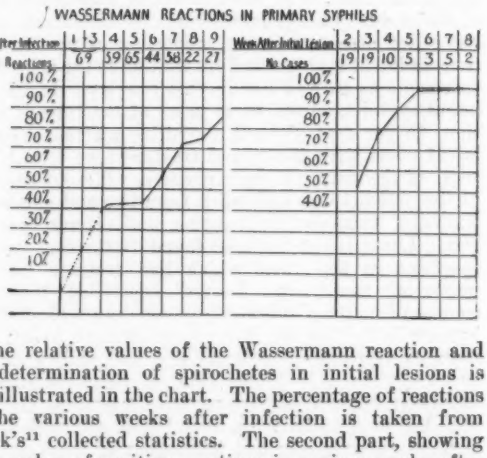
which are subject to direct examination, such as the optic nerve and fundus of the eye, the frequent involvement is almost appalling. For example, Wilbrandt[10] found evidence of irritation in forty-five out of 200 cases of secondary syphilis. This irritation is, no doubt, due to the presence of the spirochete, for in no other secondary lesions of any kind do we have evidence of irritation without the presence of the spirochete bodies themselves. The relation of this early involvement of the nervous system to the later manifestations, both tertiary and parasyphilitic, must be carefully considered. Probably during the early secondary period the seed is sown which will cause the development later of diseased brains and spinal cords—blindness, deafness, ataxias and insanities.

The wide-spread use of the Wassermann reaction has diverted the attention of many clinicians from the importance of the finding of spirochetes as a diagnostic measure. To many the spirochetes have only an academic bearing. Their presence in sections of various syphilitic lesions, both cutaneous and visceral, has been of interest to the pathologist, but their determination in the primary lesion or suspicious ulcers, as an aid to diagnosis, has been and is much neglected. That the *Spirochæta pallida* is the etiologic agent in syphilis has been proved beyond doubt. Their etiologic rôle demands their presence in every primary syphilitic lesion, and they can be demonstrated at some time in every accessible, untreated chancre. The difficulty in finding them varies with the age of the chancre, the previous treatment and mode of examination. In fresh, untreated chancres they can be found in 100 per cent. of examinations. In older lesions, when the ulcer is beginning to heal, it is more difficult to find them in serum from the surface. They can also be easily demonstrated in the mixed sores and phagedenic ulcers. Local antiseptics rapidly remove them from the surface of the ulcer, so that negative findings are of less value than in untreated chancres. This point cannot be too strongly emphasized. No suspicious ulcer should have local antiseptics applied until a diagnosis is made. The usual application of mercuric chlorid and calomel or black wash renders exact diagnosis impossible until the appearance of a positive Wassermann reaction or of secondary symptoms.

EARLY DIAGNOSIS OF SYPHILIS

The technic of examination for the spirochete is one of the simplest in clinical microscopy. A laboratory, such as is necessary in many other diagnostic procedures, is not required. Doubtless the dark-field microscope is the best instrument for routine use. With it the spirochetes can be seen in a living condition and their various characteristic movements studied. A moving object catches the eye much more quickly than one in a stained spread, and many more spirochetes will be seen in a dark-field preparation than in a stained specimen of the same serum. Moreover, no time is lost in staining. Next in simplicity is the India-ink method, but it has the least diagnostic value. The thickness of the "shadow" depends on the thickness of the spread, and different varieties of spirochetes may have a similar appearance. This method should be used only in connection with some differential stain. The best of these is the Giemsa, which should be employed whenever there is a doubt of the nature of the organism found by other methods. Its chief disadvantages are the time required and the difficulty of seeing the spirochetes, especially to the person with little experience.

How far from universal is the use of this important diagnostic method is well illustrated by the reports from fifteen representative medical schools in widely different parts of the country. The total number of graduates from these schools last year was 1,052. Only ten of the fifteen schools owned dark-field microscopes. Five of the graduating classes, representing 536 men, had not seen the instrument. In six of the schools it was used only for demonstration purposes. In only four did the students have any practical experience with it. The use of the staining methods was taught to about the same extent, so that less than one-fourth of the graduates of these fifteen schools had any experience from a practical standpoint in the finding of spirochetes. Doubtless most of these graduates could give in parallel columns the differential diagnosis between chancre and chancroid, yet they could not make the exact diagnosis with a method which can be so easily learned. The recent work in experimental syphilis suggests the possibility of keeping a few rabbits with chancres of the scrotum, which would furnish material for students to prepare their own demonstrations; and with a little extra time they might do the actual animal inoculations and watch the clinical development of the lesion, an observation impossible in human subjects.



The relative values of the Wassermann reaction and the determination of spirochetes in initial lesions is well illustrated in the chart. The percentage of reactions in the various weeks after infection is taken from Bruck's[11] collected statistics. The second part, showing the number of positive reactions in various weeks after the appearance of the chancre, is from collected cases of Cummer and Dexter[12] and of Swift.[13] It will be seen that in the third to fifth weeks after infection, or about the time of appearance of the initial lesion, about 40 per cent. of the cases give a positive reaction. For the next three weeks only about 75 per cent. react positively, but practically all show a positive Wassermann before the outbreak of secondaries. The spirochetes are most easily demonstrated when the initial lesion is young. As it becomes older, the conditions are less favorable, but at this time the seroreaction is of more value. If a curve of percentage of findings of spirochetes in the various weeks after the appearance of the initial lesion were plotted, the highest point would be early, with a fall at the time of the rise in the seroreaction curve. By this it is not meant to imply that the examination for spirochetes is not of value late in the primary stage,

10. Wilbrandt: Cited by Schwartz, St. Petersb. med. Ztschr., 1912, xxvii, 99.

11. Bruck, C., and Neisser: Beiträge zur Pathologie und Therapie der Syphilis, C. Springer, Berlin, 1911.

12. Cummer and Dexter: Cleveland Med. Jour., 1911, x, 910.

13. Swift, H. F.: Cleveland Med. Jour., 1910, ix, 323.

but that it has greater relative value as an early diagnostic measure.

Aside from the diagnostic application of the seroreaction in the primary stage is its use as an indication of the extent of the invasion. Experimentally the reaction appears when there has been a general distribution of the spirochete throughout the body. Neisser[14] found that the hematopoietic organs of inoculated apes became infectious at the time of appearance of the Wassermann reaction; also that animals which were inoculated intravenously developed a positive reaction in about eight days—a much shorter period than those inoculated cutaneously.

If we accept the view that a positive reaction in the primary stage means a general invasion with the virus, it will be seen that nearly 40 per cent. of patients have a generalized syphilis at the time of the appearance of the initial lesion, but that in 50 to 60 per cent. appropriate treatment will limit the infection to its original site. Each week increases the danger of wide-spread distribution of the spirochete. Our aim should be to limit the infection as much as possible to its original site. With our former therapeutic means, this was practically impossible. Many attempts were made to abort the disease with mercury, but most of the trials failed. Hoffmann[8] states that only twice out of numerous attempts has he succeeded with the most intense application of mercury. Bering[15] reports six primary cases with negative Wassermann reactions, in which a course of calomel, followed by two more courses of mercury, was sufficient apparently to abort the disease. After the appearance of a positive reaction, abortive treatment was practically impossible.

TREATMENT BY SALVARSAN AND MERCURY

With the development of the organic arsenic compounds, the attitude toward abortive treatment has entirely changed. The probability of a rapid abortive cure has become almost certain, provided the treatment is properly carried out. The one definite effect of salvarsan has been its rapid curative value in the primary stage, and in cases in which formerly a successful abortive treatment was the exception, it is now the rule. In a recent article of Gennerich[16] on this subject, 159 cases are reported and reviewed. One hundred and four of these were treated while the Wassermann reaction was still negative and only 11 per cent. showed any subsequent appearance of the reaction, while 27 per cent. of fifty-five patients in whom treatment was started after the appearance of a positive seroreaction again showed a serum relapse. Both classes of patients had practically the same treatment; so with a given amount of treatment there is more than twice the liability to relapse if the seroreaction has appeared. Our experience has been practically the same. Three cases treated with salvarsan alone, before the appearance of a Wassermann reaction, have all remained negative, while of five which had progressed to a positive reaction stage and which were treated with both salvarsan and mercury, one has shown a slight return of the reaction, and another has shown a weak reaction after provocatory treatment.

If the disease is allowed to reach the secondary stage, the difficulty and time of cure are increased threefold. Among nine patients with beginning secondaries, only three have had persistent negative reactions. Three of the patients have shown a marked tendency to clinical relapses. Two of them have developed secondary meningitis. Only four out of fifteen cases in a later secondary period have had persistent negative reaction or been free from symptoms after the reaction had become negative following the initial treatment with salvarsan and mercury. In all the other patients a renewal of treatment was necessary. These four classes of early syphilis, namely, primary before the appearance of the positive Wassermann, primary after the appearance of the reaction, secondary with primary lesion still present, and secondary after the disappearance of the chancre, illustrate well the increasing difficulty in treatment as the disease becomes older. It is safe to say that each week's delay in institution of treatment in the primary stage adds a month or more to the necessary amount of intensive treatment.

Since the combination of salvarsan and mercury has come into use, the relative number of "cures" has materially increased. In the first part of this paper the comparative inefficiency of mercury alone was noted. The use of salvarsan alone has resulted in a large per cent. of relapses. Intravenously its action is rapid but not continuous, and hence repeated injections are necessary. A reliable rule to follow is four or five intravenous injections of from 0.3 to 0.5 gm. at intervals of from five to seven days, combined with or followed by a course of insoluble mercury intramuscularly. After the mercury, salvarsan should again be repeated. If these two powerful specifics are alternated, a most intensive treatment can be given with but little danger of an accumulative action from either drug. In the primary stage before the appearance of a positive Wassermann reaction, one course of each drug should be given. With a well-established Wassermann reaction, two courses of salvarsan and one of mercury should be given and, after the outbreak of secondaries, at least two of salvarsan and three of mercury. If this rule were followed, doubtless the majority of cases would remain free from symptoms, and the Wassermann reaction would remain negative. Of course, the treatment should be altered for special cases. What effect the introduction of neosalvarsan will have on the plan of treatment remains to be seen. If Schreiber's scheme of four injections in a week is adopted, perhaps the time will be much shortened without diminishing the amount of medicament.

MORE THOROUGH USE OF PRESENT FACILITIES

In order to carry on a successful campaign against syphilis, the attitude of the public toward the disease must be changed. It is probably not an exaggerated statement to make that in proportion to the efficiency of specific measures, syphilis is one of the most poorly treated of all the diseases. One of the reasons for this is the exclusion of the patient with syphilis from the majority of hospitals. Prof. Friedrich Müller, in discussing our hospitals, stated that he considered the exclusion of these patients one of the worst features of our hospital system. His point of view was that of an educator. He considered that the hospital year of education should furnish the young physician with as thorough a grasp of syphilis as of typhoid fever or heart disease. This attitude of hospital management toward the disease is due to various factors. It has been considered by many as a venereal disease with skin manifestations, and the more serious visceral lesions ignored. The loathsomeness, more than the serious nature of syphilis, has been emphasized in the lay mind. The syphilis of to-day is not usually the pox of the older writers, but its nervous

14. Neisser, A.: Beiträge zur Pathologie und Therapie der Syphilis. C. Springer, Berlin, 1911.
15. Bering, F.: Arch. f. Dermat. u. Syph., 1906, xxxii, 496.
16. Gennerich: Ztschr. f. Chemotherapie, Ref., 1912, i, 69.

manifestations are increasing each year. The mode of transmission is now known, and the fact well established that it is the least contagious of the contagious diseases. Comparatively simple precautions will prevent infection of attendants or other patients. Outside the body the spirochetes are more fragile than bacteria and are killed by moderate heat, drying or weak chemical solutions. Innocent infection of physicians or nurses is usually from patients in whom the disease was unrecognized.

The newer mode of treatment requires the facilities afforded by the hospital for part of its application. The intravenous injection of salvarsan should be performed only under favorable conditions, which the majority of patients cannot afford. During the eruptive period it would be far better to have all patients excluded from contact with the world at large, and the period of isolation might well be combined with the period of intensive treatment. Thus educative, philanthropic and hygienic ends would be fulfilled.

How much less is being done than might be done is illustrated in the attitude toward the disease shown in the reports from a number of hospitals and dispensaries in New York. In thirty-three dispensaries where primary syphilis is treated, spirochete examination is used as a routine in thirteen, in twelve occasionally and in eight not at all. In only thirteen is there a dark-field microscope, in twelve the Giemsa stain is used, in eight the India-ink is the only one employed. In only twelve is the diagnosis made and treatment instituted before the appearance of a positive Wassermann. In twelve others this is occasionally done. In six the routine is to wait until the appearance of secondaries. In twenty-five the patients are treated with salvarsan, "if possible," combined with mercury. The "if possible" is a very important qualification, for in but a small proportion of the cases is it possible to have the patients admitted to the hospital owning the dispensary. Among nineteen such hospitals, only five admit syphilis as a routine, four admit it in special cases, in ten there is absolutely no provision made for ward treatment of these patients. It will be seen that in the majority of institutions there is no adequate provision for either the early diagnosis or efficient treatment of syphilis. Ten hospital beds devoted to the treatment of the disease would provide in a year two weeks' hospital treatment for 250 patients. Fourteen days would provide for practically all the salvarsan treatments a patient should have in one year. The mercury could be administered in the out-patient department, and the treatment controlled by the Wassermann reaction performed in the hospital laboratory.

In the year ending Sept. 30, 1910, half of the general paralysis of the insane of the state of New York was furnished by the Island of Manhattan.[17] This number was 822 patients who would require before their death a total of 340,000 days of hospital treatment. This number of hospital days would provide for over 16,000 patients in the early stage of syphilis, at three weeks per patient. The burden of caring for the paretic falls on the public, but comparatively inadequate provision is being made by that public to cure the disease in its early stage and thus do away with the paretic. Every hospital has constantly in its wards late nervous or visceral manifestations of the disease, and yet most of these hospitals absolutely prohibit the application of preventive measures in these same wards. This is a short-sighted policy which must be corrected.

17. New York State Commission on Lunacy, Annual Report xxii, Statistical Addenda, 1909-1910.

If syphilis were a disease which affected the individual alone, he might be allowed to follow his own wishes as to his treatment, but it is a disease which is far-reaching in its effects and the burdens which it places on society. Doubtless the three diseases which cause the greatest economic loss are tuberculosis, rheumatism and syphilis. In the latter alone has science furnished us with means for early diagnosis, two specific efficient drugs and a reliable index for control of treatment. All that remains to conquer the disease is a universal recognition of the efficiency and importance of these measures and opportunity in the wards of our hospitals to apply them.

ABSTRACT OF DISCUSSION

Dr. Gedide A. Friedman, New York: I should like to make a plea for the treatment of cases of late syphilis. This is frequently overlooked, especially in patients with visceral syphilis. For seven or eight months I have had under my care a man who had syphilis twenty-five years ago, and was apparently well until five years ago, when attacks of pain started in the epigastric region; he suffered so much during these attacks that he would roll on the ground. The pain was excruciating. These attacks came on four or five times a year. After eighteen months he noticed that he had difficulty in walking, especially in the evening. He also had intermittent claudication. For years he was treated for stomach trouble. The Wassermann test, made by Dr. Noguchi, was negative in the blood but positive in the cerebrospinal fluid; the luetin test was positive. I started in with the antisyphilitic treatment and now, after seven months, the patient has had no more of these attacks of pain which used to come on about every four months. The intermittent claudication has entirely disappeared.

Dr. Theodore C. Janeway, New York: Syphilis should be recognized as an infectious disease which should be admitted for treatment in our hospitals. Aneurysm, chronic nephritis, some diseases of the myocardium, tabes and many other chronic diseases are dependent on an old syphilis. Early eradication of this infection is going to result in a tremendous diminution in the death-rate from chronic diseases in later life.

THE IMPORTANCE OF THE EARLY DIAGNOSIS OF SYPHILIS*

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The recent changes in our conception of syphilis, dating from the discoveries of Schaudinn in 1905, form one of the most interesting and important chapters in the history of modern rational medicine. Previous to this fundamental discovery, our knowledge of syphilis was based purely on clinical observation; diagnosis was never certain until the secondary stage and, once the visible manifestations of the disease had disappeared, treatment was guided largely by rule of thumb. When no secondary signs appeared, or when they were of so evanescent a character as to be overlooked, a positive diagnosis was rarely possible. As a result of this unfortunate lack of definite knowledge, many cases of syphilis were recognized only when some tertiary or parasyphilitic manifestation made its appearance; or individuals who had never had the disease received years of unnecessary antiluetic treatment for a phantom condition. Up to 1905, then, the diagnosis of syphilis was

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* From the Department of Medicine of Western Reserve University.

often in doubt and occasionally impossible to make, unless the disease ran an absolutely typical course, which outside of the text-books is the exception rather than the rule.

Schaudinn's[1] discovery of the etiologic factor of syphilis followed closely by Wassermann's announcement of his complement fixation reaction led to a vast amount of work, which not only has thrown much light on the pathology and biology of syphilis, but has been of inestimable value to the profession at large. It is possible to-day not only to make an early and positive diagnosis in a large proportion of cases of syphilis, but also to institute treatment which will cure the disease, instead of masking it over a long period of years.

So much has been written about the *Spirochæta pallida* and the Wassermann reaction that it is unnecessary to describe either at this time.

During the past two years we have seen a large number of individuals who were either luetic or suspected of being luetic. It is impossible to observe a number of such cases without being impressed with the necessity for deciding definitely at the earliest possible moment whether the condition in question is syphilis or not. We have been fortunate in having had the opportunity to examine a number of cases in the earliest stage of the disease. It has seemed to us worth while to report them with special reference to the results of the search for the spirochete in the lesions, and of the examination of the blood by means of the Wassermann reaction. We have been struck with the variability of the clinical appearance of the primary lesions which we have seen. Roughly, 50 per cent. of lesions which later proved to be syphilis scarcely conformed at all to the usual conception of the syphilitic chancre.

Fifty-two cases of primary syphilis have come to our notice in which we have been able to obtain sufficient history or other evidence on which to base conclusions. The initial lesions were distributed as follows: genital, forty-three; lip, six; tonsil, two; tongue, one. It is interesting to note that nine of these lesions, or 19.2 per cent. were extragenital chancres, whereas the history of an extragenital lesion in an old case is most uncommon.

The technic used in performing the Wassermann reaction is the modification recommended by Swift.[3] An alcoholic extract of syphilitic liver has been used as antigen. For detecting the spirochete numerous methods have been recommended, but the general consensus of opinion is that the dark-field condenser gives the best results.

Recently Phillips and Glynn[4] have published a number of observations on the comparative value of the different methods of finding the organisms of syphilis, and they conclude that the dark-field illuminator gives the highest percentage of positive findings in the shortest time. They also show that many more organisms can be found in a given time with this method than with others. This entirely agrees with our experience.

Various staining methods, however, may be employed and commend themselves to a worker for whom a dark-field condenser would represent an unjustifiable expense. We have found Giemsa's stain very satisfactory. In fact, there is no reason why the practitioner who has a good working knowledge of laboratory methods and a microscope supplied with an oil immersion lens cannot make this search provided that the irritation serum is obtained as directed. This is essential. By this method the spirochete appears as a dark violet or purple closely curled spiral, the length being one and one-half to three times the diameter of an erythrocyte. The turns are close and numerous, ranging from six to twenty-six in each organism.

Burri[5] has recommended the use of India ink to demonstrate the spirochete. With this method the spirochete is seen as a colorless spiral against a dark background, much as in the dark-field preparation. Barach[6] has shown that the India ink method may lead to serious errors, through its tendency to show curious spirochete-like artifacts.

The disadvantage with all the staining methods is that not only do most of them consume a considerable amount of time, but also that the differentiation between the *Spirochæta pallida* and other nearly related and morphologically similar organisms is much more difficult in the stained specimen than in the dark-field preparation.

The organisms may be recovered from the primary sore, or from the skin lesions, mucous patches and condylomas of the secondary stage, and occasionally from the fluid obtained from the glands in the neighborhood of the primary sore. While we have found spirochetes in the skin rashes, we have had far better success in recovering them from the primary sores, and lesions of the mucous membranes. It is of the utmost importance that the lesion to be examined has not been cauterized or treated locally with mercury, for the application of a mercurial dusting-powder or ointment will often render a search for spirochetes useless. It goes without saying that the patient should receive no mercury until the diagnosis has been made, for not only will it mask the symptoms, but also will often vitiate the results of the Wassermann reaction.

The prerequisite for success in making the examination for the spirochete is in obtaining "irritation serum" from the deeper layers, avoiding surface contamination. The lesions are carefully cleaned with sterile normal salt solution on pledgets of cotton and then scraped with a dull curet. If serum fails to flow freely, passive hyperemia is induced by the application of a small suction-cup. After removing the blood the clear serum which finally appears is taken up with a platinum loop or capillary pipet. A drop or two of this serum is mixed with a drop of normal salt solution and examined at once by means of the dark-field condenser. In this way the organisms can be seen in the living state and their contour and movements carefully studied, which, after a little practice, makes the identification of the organism comparatively simple. The serum for stained specimens is obtained in the same way. A few drops are put on a cover-slip and allowed to dry in the air. They are then fixed with methyl alcohol and stained.

The examination for the spirochetes is the most important method of diagnosis during the early days of the disease. Usually at this stage, the Wassermann reaction has not developed in the blood, whereas the early lesions are those which yield the largest number of organisms.

During the past year we have examined twenty-two cases during the first four weeks after the appearance of the chancre and have found the organisms in all but five. It is interesting to note that of these five cases

1. Schaudinn and Hoffmann: Berl. klin. Wchnschr., May 29, 1905.
2. Wassermann, Neisser and Bruck: Deutsch. med. Wchnschr., 1906, xxxii, 745.
3. Swift: Internat. Clin., Series 20, 1.
4. Phillips and Glynn: Brit. Med. Jour., 1911, No. 2654, p. 1283.
5. Burri: Das Tuschverfahren, etc., Jena, 1909.
6. Barach: THE JOURNAL A. M. A., Nov. 26, 1910, p. 1892.

three had had local application of mercury to the sore. In one case we found numerous organisms, twenty-four hours after the appearance of the sore, which when first seen was merely a small superficial excoriation on the foreskin, in no way resembling a primary lesion.

Table 1 will serve to classify the cases.

TABLE 1.—EXAMINATION FOR SPIROCHETES

Duration of Lesion	Total Number of Cases	Spirochetes Found
During first week	5	5
During second week	9	6
During third week	5	3
During fourth week	3	3
After fourth week	3	0
Total during first two weeks	14	11
Total during second two weeks	8	6
Total during first four weeks	22	17

We have used the Wassermann reaction in a larger number of cases of primary syphilis, forty-eight in all. Reactions were repeated on thirteen cases. Of the cases examined during the first week after the appearance of the chancre, only 50 per cent. gave Wassermann reactions. The cases seen during the second week showed 65.5 per cent. positive reactions. During the third week positive reactions were found in 81.2 per cent. and during the fourth week in 87.5 per cent. Cases examined from the fifth week to the eighth week, inclusive, showed 100 per cent. of positive reactions. The gradual but steady increase in the reliability of the Wassermann reaction during the first five weeks is of considerable interest (see Chart I).

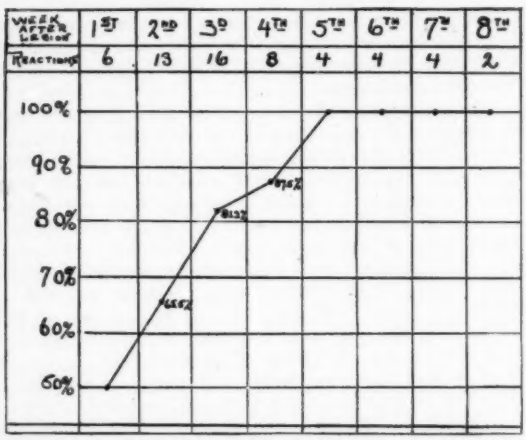

Chart showing percentage of positive Wassermann reactions in primary syphilis, according to weeks after infection.

During the first two weeks after the appearance of the lesion there were nineteen cases with eleven, or 53.2 per cent., positive reactions. The examination for spirochetes during the same period gave positive results in eleven out of fourteen cases, or 78.5 per cent. This suggests that during the first two weeks the examination for the organisms will render a considerably higher percentage of positive diagnoses than will the Wassermann reaction.

We performed Wassermann reactions in forty-three cases during the first four weeks after the appearance of the primary lesion. Of these 31, 72.1 per cent., gave positive reactions. During the same period of the disease a search for the organisms was made in twenty-two cases, with positive findings in seventeen, or 77.2 per cent. From this it will be seen that up to the beginning of the fifth week after the appearance of the chancre the examination for spirochetes will give the higher percentage of positive diagnoses, but the Wassermann reaction will serve to detect certain cases in which a search for the spirochete gives negative results.

We have seen several such cases, one of which is of enough practical importance to warrant description.

The patient, a young man, had had an indolent, slowly spreading ulcer of one tonsil for a period of two weeks. Though he admitted exposure about six weeks previously, he had seen no evidence of either primary or secondary lesions. His throat was not typical of syphilis, and his physician had been using daily local applications of silver nitrate. As the throat did not heal, he was referred to us for bacteriologic examination. He had received his last application of silver nitrate a few hours before we saw him. Both tonsils showed superficial yellowish excoriations, which were not typical of syphilis. Careful examination showed no spirochetes. There were, however, enormous numbers of the spiral organisms and of the fusiform bacilli which we have learned to associate with the condition known as Vincent's angina. These findings caused us to feel that we were probably dealing with a non-syphilitic condition. The blood was taken and showed a strongly positive Wassermann reaction; another search for the spirochetes, made two days later, after the local applications of silver nitrate had been stopped, revealed numerous organisms of syphilis.

Fifty-seven reactions were performed in forty-eight cases. There were thirteen cases which on the first examination showed negative reactions. Seven of these were reexamined before the appearance of the secondary signs. Out of forty-eight cases examined a positive reaction was obtained eventually, before the appearance of the secondary signs in forty-two, or 87 per cent.

We give in Table 2 the results of other workers in this field.[7]

TABLE 2.—POSITIVE REACTIONS OBTAINED BY VARIOUS WORKERS

	No. of Cases.	Per Cent. Positive.
Collected by Noguchi	416	69.8
Noguchi (by his own method)	70	92.8
Swift	21	81.0
Collected by Bruck	520	64.4
Bruck, Stern, Merz and Grosser	111	72.1
Kaplan	231	86.9

The analysis of Kaplan's[8] cases is interesting (Table 3).

TABLE 3.—RESULTS OBTAINED BY KAPLAN

Primary Lues.	Number of Cases	Number Positive	Per Cent. Positive
Less than three weeks' duration, no mercurial treatment	101	90	89
Less than three weeks' duration, after mercurial treatment	20	12	60
More than three weeks' duration, no mercurial treatment	74	72	97
More than three weeks' duration, after mercurial treatment	36	26	72

7. Pearce: Arch. Int. Med., 1910, vi, 478.
8. Kaplan: THE JOURNAL A. M. A., Dec. 3, 1910, p. 1952.

During and after the fourth week we have found positive reactions in all but one of the twenty-two cases examined during this period. At this time the local lesion frequently begins to heal spontaneously and there is sufficient fibrous tissue present to prevent the oozing of the irritation serum from the deeper layers which is absolutely necessary if the organisms are to be found. The hunt for spirochetes becomes less fruitful as time goes on.

As instances of the usefulness of one test or the other, we might call attention to the six lip and two tonsillar chancres, which might not be diagnosed readily under ordinary circumstances. Two of these were due to cuts inflicted by barbers. One of the tonsil cases was peculiar in regard to history:

The patient had had a throat affection about eight weeks previous to the time when we saw him. From his history it would appear that he had suffered from an attack of acute follicular tonsillitis. The physician who attended him made applications to the tonsils and the condition disappeared. Four weeks later his throat again became sore. When our examination was made, both tonsils were enlarged and indurated, and presented ulcerated surfaces with a thin, translucent, grayish-white coating. Spirochetes were found and the Wassermann reaction was strongly positive.

It is obvious that these two diagnostic measures tend to supplement each other completely.

If both tests are performed at the same time a very definite opinion as to the presence or absence of syphilis can be given. We have examined twenty cases with both tests done at the same time, and found one or the other or both tests positive in each of the twenty cases (Table 4).

TABLE 4.—EXAMINATION OF TWENTY SYPHILITIC PATIENTS BY THE WASSERMANN TEST AND BY SEARCHING FOR SPIROCHETES

Serial Number	Location of Lesion	Duration of Lesion	Result of Wassermann	Result of Spiro. Exam.	Remarks
8	Penis.	2 weeks.	—	Present.	One week later Wassermann ++
17	Penis.	10 days.	—	Numerous.	Wassermann +++ at end of 4 weeks.
18	Penis.	3 weeks.	+++	Not found.	
20	Lip.	3 weeks.	+++	Numerous.	
25	Lip.	6 weeks.	+++	Not found.	Had used $HgCl_2$ wash locally.
26	Lip.	2 weeks.	—	Not found.	Wassermann + one week later.
28	Penis.	3 days.	—	Present.	
29	Intra-urethral.	1 week.	—	Present.	
31	Tonsil.	4 weeks.	++	Present.	
33	Tonsil.	4 weeks.	+++	Present.	
34	Penis.	11 days.	—	Present.	
35	Lip.	9 days.	++	Not found.	
36	Penis.	7 weeks.	+++	Present.	
37	Penis.	3 weeks.	+++	Present.	
38	Penis.	3 weeks.	+++	Not found.	
41	Penis.	5 weeks.	+++	Not found.	
42	Penis.	2 weeks.	+++	Not found.	
44	Penis.	1 week.	+++	Present.	
45	Penis.	2 weeks.	+++	Present.	
47	Penis.	1 week.	—	Present.	

In closing, it is only necessary to reiterate that a diagnosis of early syphilis cannot be made with any safety on clinical grounds alone; that no sore on the genitalia or elsewhere, which in any way suggests a primary lesion, should be considered non-syphilitic until repeated observations from bacteriologic, serologic and clinical points of view have substantiated its non-syphilitic character; that the examination for the *Spirochæta pallida* is by no means a difficult procedure; and that the profession at large should be as familiar with it as it is with the examination of the sputum for tubercle bacilli; that the bacteriologic and serologic methods are and must be a part of the diagnosis of syphilis if the diagnosis is to be made early, and that an early diagnosis is of the greatest importance in the combating of the disease in a rational and intensive manner.

The serologic portion of this paper is from the H. K. Cushing Laboratory of Experimental Medicine of Western Reserve University, Cleveland.

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A COMPARISON OF NORMAL AND SYPHILITIC EXTRACTS BY MEANS OF THE WASSERMANN AND EPIPHANIN REACTIONS *

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In the course of some titrations of luetic serums by means of the Wassermann reaction, it was noticed that normal extracts in certain dilutions ceased to fix complement in dilutions of the serum in which extracts from syphilitic tissues gave definite fixation. This observation stimulated us to study more carefully the part played by normal and luetic tissues in the Wassermann reaction, with the hope of throwing some additional light on the much-debated question of specificity.

When the test was first published by Wassermann, Neisser and Bruck, the antigen was thought by these investigators to represent the syphilitic virus, and the reaction that occurred as one between mutually specific bodies, i. e., between antigen and antibody, the resulting combination having the power to fix the complement. The Wassermann reaction was thought to be analogous to the complement fixation test in other infectious diseases, notably tuberculosis, typhoid and gonorrhea. In these infections the possibility of preparing an extract of the causative agent makes it almost certain that in them we are dealing with a reaction between specific antibody and antigen, in the sense that typhoid antibody and typhoid bacilli are reciprocally related.

Subsequent investigations on the nature of the Wassermann reaction soon made it necessary to modify the original conception of the complement fixation test for syphilis. It could no longer be regarded as a reaction which occurred between the syphilitic virus and specific antibodies. The work of Marie and Levaditi, Weil and Braun (tumors), Landsteiner (guinea-pig liver), Müller and Poetzl[1] (alcoholic extract of guinea-pig heart), and still other investigators showed conclusively that the Wassermann reaction could also be carried out by using extracts of non-syphilitic tissue, i. e., of other pathologic tissue or normal tissue.

Whereas, this discovery does not affect the reliability of the reaction for diagnostic purposes, for it has been found that positive results are still only obtainable

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* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the authors' reprints. A copy of the latter will be sent by the authors on receipt of a stamped addressed envelope.

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1. Meier, G.: Jahresb. über die Ergebn. d. Immunitätsforsch., 1909, v, 140, contains complete bibliography and discussion of the subject.

when the serum comes from cases of syphilis or from certain well-known diseases in which the diagnosis is not likely to be confused with syphilis; it does make it difficult to bring into relation the immunity processes in other infectious diseases with the reaction processes occurring in syphilis. In the past we could not speak of antispirochetal antibodies, inasmuch as attempts to produce complement fixation by the use of cultures of *Spirochæta pallida* had failed. Recent investigations by Noguchi, however, working with pure pathogenic cultures of the spirochete,[2] have shown that complement fixation can be obtained by use of pure cultures of the spirochete as antigen (not alcoholic extract) with the serum of inoculated rabbits.[2] There certainly seems to be evidence that specific as well as non-specific factors play a part in the syphilitic process, although the exact rôle of each factor is not yet clear.

Our experiments with the Wassermann and epiphanin reactions have led us to the conclusion that non-syphilitic extracts are not entirely equivalent to extracts from syphilitic tissues; syphilitic extracts contain, besides the non-specific complement-fixing substance or substances present both in non-syphilitic and syphilitic organs, certain other components which depend for their existence on the syphilitic poison in the specific tissue. These may be the *Spirochæta pallida* (?), its virus, its decomposition products or the metabolic products to which it may give rise in the tissue.

Before entering into the details of our observations, it may be well to state briefly the views of different observers.

The original conception of the Wassermann reaction as one between mutually specific bodies was based largely on animal experimentation. Wassermann, Neisser and Bruck were able to show that the serum of infected monkeys, and of those immunized with watery extracts from syphilitic organs could fix complement only with syphilitic antigen, but not with normal antigen. This view is no longer strictly held in its original form even by the discoverers of the reaction. A departure from it was made necessary, as already stated, by the discovery that alcoholic extracts from normal as well as from syphilitic tissues would give the reaction.

At present there are two main views regarding the nature of the antigen and antibody in the Wassermann reaction. Investigators may be divided into two groups according as they support the one view or the other.

The vast majority of investigators regard the reaction as non-specific. The antibodies in luetic serum are according to this view reaction products to an abnormal metabolism which accompanies the syphilitic process. These abnormal products are, according to some, protein derivatives (Weil and Braun).[1] According to most observers they are lipoids capable of being extracted by alcohol and present in all tissues, but to a much larger extent in syphilitic organs.

On the other hand, the second group of investigators, among them Wassermann, Bruck, Citron and Meier, support the dualistic view.[1] They maintain the original view of the specificity of the reaction with certain modifications. They contend that alcoholic extracts of syphilitic tissues contain two components—a non-specific lipoid substance present also in extracts from non-specific tissues, and a specific protein-like body present only in syphilitic extracts. According to Citron,[3] the specific element is a toxic substance arising only in the syphilitic process, which unites with the lipoids of the tissues to form a toxolipoid, and, analogously to the toxolipoids of snake venom, is capable of producing a reaction within the organism, resulting in the formation of antibodies. The ability of these antibodies to unite with the lipoids alone—the non-specific components of the antigen in binding complement—explains, according to Citron, why normal alcoholic extracts can fix complement.

Recent application of new methods to the study of this phase of the reaction has lent some support to this dualistic conception. In 1910, Weichardt[4] was able to apply his epiphanin reaction to the identification of antibodies in the serum of syphilitic patients. In the same year Seiffert[5] reported a series of seventy-five cases studied by this method. Of the seventy-five serums studied there was a correspondence between the Wassermann and epiphanin reactions in sixty-four serums, or in about 85.3 per cent. Of these, forty-three, or 57 per cent. of the seventy-five studied, were positive, and twenty-one, or 28 per cent., were negative. In this series the epiphanin reaction was positive and the Wassermann reaction negative in nine cases. These will be discussed later. In no case was the Wassermann reaction positive and the epiphanin reaction negative. Of twenty-eight non-syphilitic human serums, including cases of typhoid, paratyphoid, tuberculosis, scarlet fever, gonorrhea, erysipelas, measles and diphtheria, and in six tuberculous and six healthy guinea-pigs, as well as in two rabbits, the epiphanin reaction was negative. Ten serums, eight positive and two negative, were titrated with an alcoholic extract of luetic liver and an extract of guinea-pig heart. In every case it was found that alcoholic extracts of syphilitic liver gave a positive reaction, whereas extracts from normal guinea-pig heart gave a negative reaction with luetic serums. This led Seiffert to conclude that for the epiphanin reaction a specific component was necessary which was present in alcoholic extract of syphilitic livers, but not in alcoholic extract of normal guinea-pig heart.

Izar[6] working with a method depending on similar principles, the miostagmin reaction, obtained similar results. He, too, found that syphilitic cases gave a positive and non-syphilitic cases a negative reaction with syphilitic antigen. By working with various antigens he found that alcoholic extract of guinea-pig heart, alcoholic extract of normal human liver and artificial extract of Sachs-Bordoni all gave negative results, and that alcoholic extract of syphilitic liver gave positive results with luetic serums. In a later communication by Izar and Usuelli,[7] however, alcoholic extract of guinea-pig heart and normal human liver were stated to be available as syphilitic antigen. In our work we have been able to confirm and extend the observations of Weichardt, Seiffert and others.

The results of comparative titrations with normal and syphilitic extracts by the Wassermann reaction can be better understood from a consideration of the method employed.

METHOD EMPLOYED IN WASSERMANN REACTION

The technic used in doing the Wassermann reaction is approximately the same as that used in the Wassermann laboratory. Only inactivated serum is used. The titer of the amboceptor (antisheep, rabbit) is determined for every

2. Personal communication from Dr. Noguchi.
3. Citron, J.: Ergebn. d. inn. Med. u. Kinderh., 1909, iv, 353.
4. Weichardt, W.: Ztschr. f. Immunitätsforsch., 1910, vi, 651.
5. Seiffert, G.: Deutsch. med. Wchnschr., 1910, No. 50, p. 2333.
6. Izar: München. med. Wchnschr., 1910, No. 4, p. 181.
7. Izar and Usuelli: Ztschr. f. Immunitätsforsch., 1910, vi, 624.

complement used, and four times the titer is used in the reaction. Each patient's serum is tested with two or three extracts of known value, the routine being to use three extracts. Incubation is done in a water-bath. All the necessary controls are made.

Method of Making Antigens.—For normal organ extracts beef hearts and the livers of normal fetuses were used. The extracts of beef hearts were made according to the method described by Noguchi. The extracts of normal and syphilitic liver were prepared by shaking the finely ground liver substance with ten volumes of absolute alcohol several hours, after which the extraction was continued at 37.5 C. for two days with frequent shakings. The extract was then filtered and preserved in dark glass bottles at room temperature.

Blocks are made from all tissues used except the beef heart, and the presence or absence of *Spirochæta pallida* established. In all tissues used the degree of fatty degeneration was noted. All syphilitic extracts are proved by the presence of the organism in the tissues, the normal tissues being submitted to the same careful examination.

The extracts are investigated for their hemolytic, anticomplementary and antigenic properties, and only those fit for the reaction are selected.

In determining the antigenic value of the extracts, an extract of known antigenic value was used, and parallel titrations carried out, using a known positive patient's serum.

These titrations were made in two ways: First, to parallel series of tubes containing one unit of diluted and inactivated positive patient's serum and complement were added known and unknown extracts in equal dilutions ranging from 1:5 to 1:200. After the addition of the hemolytic system, the series were incubated at 37.5 C., and the point at which complete fixation was no longer obtained noted.

In the second titration, all the extracts were used in a constant dilution of 1:10, and added to tubes containing one unit of guinea-pig complement, and increasing dilutions of the patient's serum ranging from 1:5 to 1:100. The point at which complete fixation ceases was again noted.

With this comparative method of titration it was found that normal extracts could be diluted to a greater degree and still give fixation in a constant dilution of patient's positive serum. On the other hand, when the patient's serum was diluted, fixation was obtained with the syphilitic extract at a point beyond that at which fixation ceased to be obtained with a normal extract. A specific instance may be cited. One of our normal extracts in a dilution of 1:300 gave fixation with a positive serum diluted 1:5, while a syphilitic extract with the same positive serum ceased to give fixation far below this point. If, however, the extracts were used in dilutions of 1:10, and the patient's positive serum diluted, fixation with the syphilitic extract took place in a dilution of 1:40 of the patient's serum, whereas, with the normal extract, fixation ceased to occur beyond a dilution of 1:20 of the patient's serum.

We are aware that these observations can be interpreted in two ways: In the first place, it is generally conceded that specific extracts are more anticomplementary than non-specific extracts, and that this anticomplementary activity may explain the results obtained. In the second place, the observations may be interpreted to mean that specific extracts contain over and above the non-specific complement-fixing substances present both in syphilitic and non-syphilitic tissues certain other substances, perhaps of a more specific nature, capable of action in less concentration, and therefore in greater dilution of the patient's serum.

It is obvious that the one or other interpretation would gain support in its favor if a comparison of specific and non-specific extracts could be made by use of methods which lay claim to greater specificity than the Wassermann reaction is generally conceded to have. For this purpose we have conducted parallel titrations with the physicochemical method known in the literature as the epiphanin reaction (ἐπιφάνεια, surface).

This reaction depends on an observation made in 1908 by Weichardt.[8] This investigator found that diffusion is accelerated when differently colored solutions of antigen and its specific antibody are brought together. Changes in diffusion are associated with changes in the surface tension, both of which depend on a change in the osmotic pressure. This phenomenon he was able to demonstrate by the use of various physicochemical instruments (capillary tubes, chemical balance and diffusiometer). Later Ascoli made use of similar principles in measuring the surface tension of mixtures of antigen and antibodies with the Traube stalagmometer.

In 1909, Weichardt[4,9,10] made the reaction more accessible to practical use by introducing into the solutions of serums and antigen a system composed of sulphuric acid and barium hydroxid together with certain catalytic agents. By the use of phenolphthalein as an indicator he could show that fresh serums in high dilutions alter the surface tension of the finely divided barium sulphate particles by their colloidal action, so as to increase the adsorption of H-ions, thus rendering the solution more alkaline.

Without entering into the details of the physicochemical principles involved, the following generalizations may be made:

Solutions containing colloids, i. e., antigen alone, antiserum alone or antigen plus non-specific antiserum in certain dilutions, act in the above system by shifting the phenolphthalein end-point[11] in the sense of increased OH-ions (pink color).

Specific antigens can inhibit the activity of their specific antiserums, the specific antigen-antibody combination then becoming evident *in vitro* by a shift of the phenolphthalein end-point in the sense of increased H-ion concentration (light color).

The underlying principles of the epiphanin reaction have been confirmed by Kraus and Amiradzibi,[12] and extended by a number of investigators—Schroen,[13] Seiffert,[5] Mosbacher[14] and others. The specificity of the reaction has been proved beyond question by its application to the identification of a host of antigen-antibody combinations *in vitro*. Experiments have already been conducted with the following antigens and their antibodies: diphtheria toxin, tetanus toxin,[4] kenotoxin,[9] uvea albumin,[15, 12] extract of typhoid and tubercle bacilli,[4] extracts from placenta with the serum of pregnant women, extracts of tumors and their antibodies,[4] and lastly extracts of syphilitic fetal livers with the serum of syphilitic patients.[5] It is especially with the titration of syphilitic serums that we are concerned.

In carrying out the epiphanin reaction the method used is essentially that given by Weichardt[16] in his latest communication on this reaction. The arrangement of

8. Weichardt, W.: Berl. klin. Wchnschr., 1908, No. 20; Centralbl. f. Bakteriol., xlii, 143; Centralbl. f. Bakteriol., xlvii. 39.
9. Weichardt, W.: Ueber Ermüdungsstoffe, Stuttgart, Ferd. Enke, 1910.
10. Weichardt, W.: Deutsch. med. Wchnschr., 1911, No. 4, p. 154.
11. By the end-point is meant the point of neutralization when acid and alkali are brought together in the presence of phenolphthalein as an indicator.
12. Kraus and Amiradzibi: Ztschr. f. Immunitätsforsch., 1910, vi, 16.
13. Schroen, F.: München. med. Wchnschr., 1910, No. 38, p. 1981.
14. Mosbacher, E.: Deutsch. med. Wchnschr., 1911, No. 22, p. 1021.
15. Weichardt and Kümmel: München. med. Wchnschr., 1911, No. 32, p. 1714.
16. Weichardt, W.: Berl. med. Wchnschr., 1911, No. 43, p. 1935.

test-beakers recommended by him has not been followed, since it soon became apparent that the method here given was reliable and less time-consuming.

METHOD EMPLOYED IN EPIPHANIN REACTION

Five constituents enter into the test:

1. High dilutions of the antigen ranging from 10^2 (1:100) to 10^4 (1:10,000). As in the Wassermann reaction, not every antigen has the properties which characterize it as good. The qualities of an antigen and the dilutions in which it works best can be determined only by preliminary tests. The dilutions of serum and antigen were made with physiologic salt solution.

2. High dilutions of patient's fresh, unheated serum to be tested. The dilutions used in our tests have ranged from 10^2 (1:100) to 10^{10}. Generally speaking, it is best to use the higher than the lower dilutions. As will be pointed out in the discussion of the results, the use of too concentrated solutions of serums and of antigen may lead to erroneous results.

3. A normal solution of sulphuric acid.

4. A saturated solution of barium hydroxid made equivalent to the normal solution of sulphuric acid. In the use of the barium hydroxid it is imperative to prevent its exposure to the air. A solution which has become cloudy owing to the entrance of carbon dioxid should not be used. In carrying out the test it is best to pour out an amount of barium hydroxid needed for the test into a rubber-stoppered bottle or test-tube so as not to contaminate the stock solution.

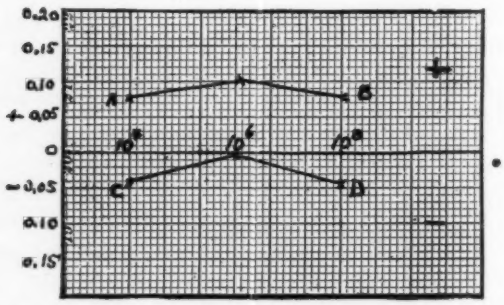

Chart 1.—A-B, curve of positive syphilitic serum using extract (H) of syphilitic liver; C-D, curve of positive syphilitic serum using extract of normal liver.

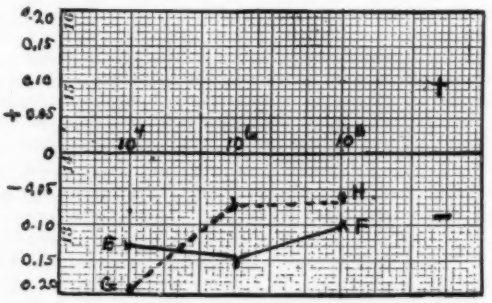

Chart 2.—E-F, curve of negative syphilitic serum using extract of syphilitic liver; G-H, curve of negative syphilitic serum using extract of normal liver.

5. A 1 per cent. alcoholic solution of phenolphthalein containing 1 per cent. of a 10 per cent. solution of strontium chlorid. The strontium chlorid has been found to catalyze the reaction.

The reaction is done as follows: A number of clean beakers of about 50 c.c. capacity are used. For each dilution of the serum a separate beaker is required. One beaker is used for an antigen control, and another to control the system of barium hydroxid and sulphuric acid. In our tests, five beakers were used, Nos. 1, 2 and 3 constituting the main test, No. 4 the antigen control, and No. 5 the system control.

The reagents are added by means of overflow pipets to be described later. To each of the first four beakers is added 1 c.c. of the dilute antigen to be used in the test (about 10^4). To Beaker 5 is added 1 c.c. of the salt solution used in making the dilutions of the antigen and the serums. Now 0.1 c.c. of the dilute serum to be tested is added to each of the first three beakers, each beaker, however, containing the same serum in a different dilution. To Beaker 5 the same quantity of salt solution is added, but to Beaker 4, the antigen control, no serum or salt solution is added.

To each of the five beakers the system of sulphuric acid and barium hydroxid and phenolphthalein is now added carefully. First, 2 c.c. of the normal sulphuric acid solution are added to each; then 2 c.c. of the barium hydroxid, and finally 0.1 c.c. of the phenolphthalein strontium chlorid mixture. It will be seen that Beaker 4, the antigen control, contains all the constituents of the Test-Beakers 1 to 3 except serum. To make Beaker 4 qualitatively as well as quantitatively equal to Beakers 1 to 3, 0.1 c.c. of the dilute serum (the average of the dilutions of serum which are used in the test) is now added to Beaker 4, the reaction having already taken place.

The addition of the sulphuric acid and barium hydroxid requires great care. Since the reaction depends on small differences in acidity or alkalinity, it is obvious that slight errors will vitiate the results. For the acid and the alkali separate pipets are used. After emptying the pipet of its content of acid or alkali, the last traces adhering to the inside of the pipet are removed by washing. The washings are saved and later added to the beakers to which they belong. In filling the pipets with acid or alkali the latter should first be drawn up into the pipet at least once and then emptied again before the pipet is finally filled for delivery into the next test-beaker. Only by careful attention to these points in the technic can reliable results be obtained.

Interpretation of Results.—If Beakers 1 to 3 contained the antiserum to the antigen used, a positive epiphanin reaction will be obtained, and if the barium hydroxid and sulphuric acid were previously carefully adjusted to one another, it will be found that Beakers 1 to 3 will be lighter than the antigen control, Beaker 4. The presence of a specific antigen-antibody combination has shifted the phenolphthalein end-point in the sense of increased H-ion concentration. The exact differences in the alkalinity between Beakers 1 to 3 and Beaker 4 can be quantitatively determined by titration with hundredth-normal sulphuric acid, and the results expressed as a curve.

If the antigen and antibody were not specific, the epiphanin reaction will be negative. Beakers 1 to 3 will be more alkaline than the antigen control Beaker 4, because, as previously pointed out, serums alone or antigen with non-specific serums shift the phenolphthalein end-point in the sense of increased OH-ion concentration.

The results may be plotted as curves (Charts 1 and 2). The titration values in hundredth-normal sulphuric acid are placed on the ordinates and the serum dilutions on the abscissæ. The positive values are plotted above the line and the negative values below the line as the accompanying charts show. No reaction was regarded as positive unless it gave a titration value of at least 0.05 c.c. hundredth-normal sulphuric acid. Values below 0.05 c.c. are easily within the limits of error.

Experiments with the epiphanin reaction have shown that:

1. Syphilitic extracts give positive reactions with luetic serums in about 75 per cent. of the cases.

2. Syphilitic extracts give negative reactions with serums of non-syphilitic patients.

3. Syphilitic extracts give negative reactions with serums of patients suffering from malignant disease.

4. Extracts of carcinomatous tissue give positive epiphanin reactions with serums of patients suffering from malignant disease.

5. Extracts of carcinomatous tissue give negative epiphanin reactions with the serums of luetic patients.

6. Extracts of normal tissue (fetal liver and beef heart) give negative epiphanin reactions with the serums of luetic patients.

In all, 105 serums were titrated with the epiphanin reaction. Of these, fifty-eight serums were titrated with luetic extracts obtained from five different syphilitic fetal livers, in which the spirochetes were demonstrated. The results obtained in this series may be divided into four groups: The first group consists of those serums in which the Wassermann and epiphanin reactions were in agreement. Of the fifty-eight serums, forty-three, or about 74 per cent., belong to this group. These consisted mostly of serums sent to the laboratory for diagnosis. Among these forty-three serums there were twenty-four in which both the Wassermann and epiphanin reactions were positive, and nineteen in which both reactions were negative. The negative serums include about eight cases of malignant disease which were titrated with luetic extracts.

In the second group there are eight cases in which the Wassermann reaction was positive and the epiphanin reaction negative. Clinically, the majority of these cases gave a history of syphilis. In two of these five cases the discrepancy can be accounted for by the unsuitability of the antigen, which as it later appeared also gave poor results with the Wassermann test. In two cases the antigen was used in too concentrated dilutions. As was pointed out before, too concentrated solutions of antigen and of antiserum may give erroneous results.

The third group includes four serums in which the Wassermann reaction was negative and the epiphanin reaction was positive. Three of the patients gave a definite history of syphilis, and all three have received treatment, two with salvarsan and one with mercury and the iodids. In four other cases in which the patients had received salvarsan the results are variable. In two cases both the Wassermann reaction and the epiphanin reaction were negative. In one case the epiphanin reaction was positive and the Wassermann reaction doubtful, while in still another case the epiphanin reaction was negative and the Wassermann reaction doubtful. In Seiffert's series,[5] there were five cases treated with salvarsan, in all of which the Wassermann reaction was negative, whereas the epiphanin reaction was positive.

In the doubtful group belong three serums in which a diagnosis could not be made. In one of these cases the serum was too old. About five luetic serums were heated and then tested with luetic antigen. In each case the epiphanin reaction was positive. Seiffert reports similar results. It would seem that heating the patient's serum to 56 C. for half an hour does not influence the results. The data, however, are too few to justify any conclusions on this point.

About twenty-three definitely positive luetic serums were tested with alcoholic extracts from syphilitic as well as from normal and pathologic tissues. Beef heart, normal liver and carcinomatous lymph-node were the non-syphilitic tissues used. The extract of the beef heart was the acetone insoluble fraction prepared according to Noguchi's method. The normal fetal liver and the carcinoma lymph-node were prepared in the usual way as described above. Of the twenty-three cases all but three, or about 86 per cent., reacted positively with the syphilitic extracts, and negatively with the extracts from non-syphilitic tissues. Two of the positive serums tested were mixtures each of four fresh positive serums. With these serums the difference in the behavior of syphilitic and non-syphilitic extracts was especially striking.

The results of the titration of syphilitic serums with non-syphilitic extracts seem to bear out the contention of Wassermann and his co-workers that syphilitic and non-syphilitic extracts are not entirely equivalent. It would appear that alcoholic extracts of syphilitic tissues do contain some substance which is intimately associated with the syphilitic process; but whether this is a lipoid-protein combination (Wassermann) or a toxolipoid (Citron), it is at present difficult to say.

Of the 105 serums studied, twenty-four were from patients with definite or suspected malignant disease, and a few from patients with benign tumor. Sixteen of the twenty-four patients reacted positively with extracts from carcinoma and sarcoma tisue.

The data are too meager to warrant any definite conclusions; but it would appear that the results are suggestive. More work must be done on a larger number of controls to make sure that we are not dealing with a reaction in the blood-serum characteristic of cachectic states.

CONCLUSIONS

1. Our observations with both the Wassermann and the epiphanin reactions would seem to indicate that syphilitic and non-syphilitic extracts are not entirely equivalent.

2. Comparative titrations of syphilitic and non-syphilitic extracts with the Wassermann reaction have shown the superiority of the former over the latter.

3. By means of the epiphanin reaction it is possible to demonstrate in serums the presence of antibodies specific for a given antigen.

4. The epiphanin reaction may be used to demonstrate the presence of antibodies in the serum of syphilitic patients.

5. Our observations would seem to point to the conclusion that these antibodies are directed against some substance or substances found only in the extracts of syphilitic tissue, and these antibodies are probably associated with the syphilitic process in a specific manner.

6. It must be borne in mind that these antibodies are not necessarily the so-called Wassermann bodies, although it is possible that they may be, in the sense of the conception of the dualistic theory as expressed by Wassermann and by Citron.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. DEXTER AND CUMMER AND KEIDEL AND HURWITZ

DR. A. W. M. ELLIS, New York: In the first and second week the Wassermann reaction is positive in 40 per cent. of cases. Experimental work has shown clearly that the appearance of the Wassermann reaction coincides closely with the general infection of the body. This means that in from 50 to 60 per cent. of cases in the first and second weeks we are still dealing with a local infection. There has been no general distribution of the virus to any extent. This was not of much importance formerly when mercury was used, because it has been shown repeatedly that even intensive treatment with mercury was not sufficient to prevent the Wassermann reaction from becoming positive. With salvarsan however, the condition is far different. Gennerich in the treatment of a hundred patients in whom the reaction had not yet become positive was able to prevent the appearance of

the Wassermann reaction in all but ten. One of the fundamental principles in medicine is the prevention of the spread of a local infection and the prevention of the development of septicemia. It is curious that in syphilis clinicians can still be found who advocate waiting until the occurrence of such a septicemia before making their diagnosis and beginning treatment.

DR. MARTIN COHEN, New York: During the past year I have applied the luetin test in over fifty cases of ophthalmologic complications of syphilis. In 75 per cent. of the interstitial keratitis cases the clinical manifestations and the Wassermann reaction corresponded with the luetin test. In iridocyclitis, in which chancres had occurred ten, fifteen or twenty years ago, the Wassermann reaction was negative for reasons we were not sufficiently able to explain, while the luetin was actively present. In some recent infections the control reaction, which was always done on the right arm, somewhat resembled the luetin site on the left arm, but there was not that infiltration which occurred in the luetin site. This, I think, is a very important factor. In retro-orbital tumor in which both Wassermann and clinical manifestations were negative, the luetin test was likewise negative, as was evidenced by an operation which allowed of a better view of the orbital conditions. The tumor was found to be a fibro-endothelioma.

A woman whose family history was negative gave a history of infection about twenty years ago and the luetin test was strongly positive. Operation was performed, and Dr. Ewing in his report considers it a case of syphilitic nature. I have had various other cases along the same lines. In some of them the luetin reaction was negative, but changed to positive as soon as antisyphilitic treatment was instituted. I have some cases on record which remained dormant as long as a month and a half, in which the luetin site promptly developed. I believe the three cardinal points in syphilis to be (1) the clinical manifestations, (2) the Wassermann test in early cases and (3) the luetin reaction in tertiary cases. I believe that if we consider these three cardinal factors, we shall make a step forward in our diagnosis.

DR. B. C. CORBUS, Chicago: The best method of diagnosis, of course, is with the dark-field illuminator. I believe that the method of obtaining the specimen by snipping out a small piece of chancre, as recommended by Noguchi, is the best. Every lesion that appears on the genitalia should be diagnosed microscopically, no matter how insignificant. There is a condition on the penis that is little recognized in this country, erosive and gangrenous balanitis, in which we find a spirochete and a vibrio, a spirochete that is sometimes hard to diagnose except by the dark-field illuminator. This form of balanitis may be associated with syphilis, but is most frequently mistaken for chancroidal infection. Clinically this disease appears as a balanitis, always behind a closed foreskin, and the clinical symptoms may very much simulate syphilis. The adenopathy is indolent and not at all painful, and there may be a slight rise of temperature. It is not possible to differentiate this form of balanitis from syphilis without the aid of the dark-field illuminator.

DR. S. H. HURWITZ, Chicago: I believe that because of the great constancy with which the luetin reaction occurs in cases of secondary and tertiary syphilis we have, according to present-day views, *a priori* evidence that there are such things as antispirochetal antibodies. As we all know, the explanation of the anaphylactic process that is mostly accepted to-day is that in the serum of the inoculated patients there exists some antibody which, together with the specific substance, can give rise to some third body which produces the inflammatory reaction at the site of the lesion. Furthermore, the presence of some specific substance in luetic serum follows from the work of Dr. Noguchi, who has obtained complement fixation with the watery extracts of the *Spirochæta pallida* as an antigen and the serums of inoculated rabbits. We have not been working with watery extracts, however, but with alcoholic extracts, although this does not seem to me to vitiate the results of our experiments. As was stated in our paper, according to the work of the Wassermann school there are in the alcoholic extracts of syphilitic tissues two components, a non-specific lipoid component and a specific protein-like body in combination with that lipoid; it is possible that the antibodies which we have succeeded in demonstrating have been antibodies directed against alcoholic extracts of the specific and non-specific component together, and in that sense we still wish to maintain our original point of view, that there is in syphilitic serum something which is closely identifiable with the syphilitic process.

DR. RICHARD DEXTER, Cleveland: Dr. Ellis called attention to the period before the Wassermann reaction appears. If a diagnosis can be made during that period one has a much better chance of cure with modern intensive treatment, as the infection is still local.

The suggestion of Dr. Corbus to snip out a piece of the lesion and pound it up and examine it with a dark-field illuminator is, I should think, an excellent one, though it is the first time it has been brought to my attention.

THE LUETIN REACTION *

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The skin of animals repeatedly inoculated with *Spirochæta pallida* and the skin of human beings suffering from syphilis do not behave in the same way as does the skin of non-syphilitic individuals. The skin of the syphilitic subjects reacts with an inflammation to the inoculation of the *pallida* substance (the luetin) prepared from the killed pure cultures, while the non-syphilitic skin does not. The intensity of the inflammatory reactions produced by the luetin may vary from an inflammatory nodule to a pustule formation, lasting for several days as a rule. In some instances the reaction may commence as late as three or four weeks after the inoculation. For the precise descriptions of the reaction and mode of making the test, I refer the reader to my special article.

Since the inauguration of the test, one year has passed, and the preparations of the luetin have been distributed to some hospitals and dispensaries both here and abroad during the last four months. The reports so far received are in perfect agreement with my experience already published.[1] Among those who have obtained favorable results may be mentioned Baum, Cohen,[2] Corbus, Fordyce, Fox,[3] Goldenberg and Kaliski, Gradwohl,[4] Holt and Brown, Kämmerer,[5] Moore, Nobl and Fluss,[6] Pusey, Orleman-Robinson,[7] Schmitter, Squires and Crowell, Stein, Stoll and Wolfsohn.[8] Speaking summarily the following facts have been established:

1. The luetin reaction is specific for syphilis.
2. The reaction is present in the majority of cases of tertiary, latent and hereditary syphilis.
3. It is less constantly present in secondary untreated and primary cases.
4. In treated secondary cases the reaction is present in most instances.
5. In general paralysis and tabes dorsalis the reaction is inconstant, but a positive reaction was obtained by Moore and myself in about 60 per cent. of cases.

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* Read in the Symposium on Syphilis in the Section on Genito-Urinary Diseases of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

1. Noguchi: Jour. Exper. Med., 1911, xiv, 557; THE JOURNAL A. M. A., April 20, p. 1163.
2. Cohen: Arch. Ophth., 1912, xli, 8.
3. Fox: Communication made before the American Dermatological Association, May, 1912.
4. Gradwohl: Med. Rec., 1912, lxxxi, 973.
5. Kämmerer: Münch. med Wchnschr., 1912, lix, 1534.
6. Nobl and Fluss: Wien. klin. Wchnschr., 1912, xxv, 475.
7. Orleman-Robinson: Jour. Cutan. Dis., July, 1912.
8. Wolfsohn: Bull. Johns Hopkins Hosp., August, 1912.

6. In certain cases of tertiary and hereditary syphilis there may be a considerable inflammatory reaction at the site of injection of the control fluid, and the reaction may sometimes be as strong as that produced at the luetin inoculation site.

7. The condition of the skin which gives the luetin reaction remains but little influenced by the antisyphilitic treatment, although a positive reaction can no longer be obtained in some cases which had been thoroughly treated and believed to be cured.

The relation between the Wassermann and the luetin reactions may be defined here in order that the fullest possible benefit may be derived from the use of both reactions. The Wassermann reaction is more constantly present than the luetin reaction in cases of primary and secondary syphilis, especially when only a slight amount of treatment or none was given. On the other hand, the luetin reaction is more constantly present than the Wassermann reaction in cases of tertiary and latent syphilis. Besides, in cases in which the Wassermann reaction and clinical manifestations of syphilis are very marked and the luetin reaction negative, an energetic treatment can reverse the situation completely. Thus, through the treatment the Wassermann and clinical symptoms gradually are made to disappear, while the luetin reaction becomes more distinct and the condition that gives the reaction to the luetin persists afterward, probably until a cure is effected. From the above-cited facts it may be concluded that the luetin reaction possesses a greater diagnostic value than the Wassermann in tertiary and latent syphilis, and also a decided prognostic value which the Wassermann does not.

While the application of the luetin reaction is simple enough to be within the reach of any physician, one must not underestimate the technical precautions necessary for obtaining reliable results, because all kinds of irregularity of the reaction can be obtained by a neglectful and faulty technic. Besides, it is important to become quite familiar with the reactions before one can recognize the milder form of positive reaction and avoid a misinterpretation. In short, as in the case of everything else, one has to have a certain amount of preliminary training in order to utilize the luetin reaction properly.

Neurasthenia and Obesity.—The characteristic medley of symptoms, psychic and physical, exhibited by the neurasthenic has long been a fruitful field for study by clinicians, and there must be very few phenomena associated with the disease that have not, at some time or other, been observed and placed on record. The due recognition of the fact that in neurasthenia an actual inhibition of the various secretory mechanisms of the body may occur has modified, to a certain extent, former conceptions of the malady, as also the part now known to be played in the etiology of many of its symptoms by toxic absorption. One aspect has not received the attention, perhaps, that its importance deserves—namely, the relationship of obesity to the neurasthenic state, for many neuropaths are the reverse of being emaciated and an undue corpulence is not infrequently followed by neurasthenia. Drs. L. J. Llewellyn and D. Lloyd Smith, of Llandrindod Wells, have recently called attention to the connection between the two morbid states, and in their opinion the obese neurasthenic requires the greatest care when undergoing reduction cures. They also conclude that the prognosis is better in patients who are slightly emaciated, for if a neurasthenic is afflicted with "embonpoint," as Esquirol pointed out, trouble may be expected. The possibility of latent tuberculosis in the obese has further to be borne in mind in the examination and treatment of cases of this type of neurasthenia.—*Medical Press and Circular.*

SECONDARY SYPHILITIC MENINGITIS*

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The subject of syphilitic meningitis, occurring early in the secondary period of the disease, is one which has attracted the attention of occasional observers since 1650, when Guarinoni[1] first described the condition. The meningitis usually shows itself first as a disturbance of sight or hearing and may go on to the typical picture of an acute or subacute diffuse meningitis. In Germany, Rumpf,[2] Knorre,[3] Lang[4] and Nonne,[5] in France, Gros and Lancereaux,[6] Ravaut,[7] Fournier,[8] Boidin and Weil,[9] and in England, Mott[10] and Williamson[11] have especially called attention to the condition. The advent of salvarsan has, however, given the question a prominence which it never possessed before and has led to a vigorous discussion of the real frequency of its occurrence and of the possibility of salvarsan as a predisposing factor.

In November, 1910, Finger[12] in Vienna, in his report on 170 cases of syphilis treated with salvarsan, reported seven cases showing affections of the optic and auditory nerves coming on a few hours to some months after treatment. He considered them examples of a neurotropic action of the drug. In a later communication by Mucha[13] from the same clinic, thirty-seven similar cases were reported. The contentions of Finger immediately aroused wide-spread discussion, and in the past year a very large number of these cases of affections of the cranial nerves after salvarsan have been reported.

Ehrlich,[14] from the beginning, held that these affections of the cranial nerves were due, not to a toxic action of salvarsan, but to a syphilitic meningitis developing from foci of spirochetes in the central nervous system, which had not been reached by the salvarsan. He gave them the name "neurorecidiv," and considered that the increased frequency of such relapses was due merely to a closer observation and therefore more frequent recognition.

Benario,[15] in his collected statistics, showed the frequency of such nerve relapses in mercury-treated patients, and pointed out the exact similarity of such cases to the nerve disturbances following treatment with salvarsan. This similarity and the findings obtained by lumbar puncture have proved the correctness of Ehrlich's opinion as to the syphilitic nature of the process. Lumbar puncture in these cases has shown, almost invariably, large increase in the cells, increased globulin and a positive Wassermann reaction in the spinal fluid.

The question of the relative frequency of early secondary meningitis with and without salvarsan therapy still remains an open one.

* Read in the Symposium on Syphilis in the Section on Genito-Urinary Diseases of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

* From the Hospital of the Rockefeller Institute.

1. Guarinoni: Cited by Benario, Ueber Neurorezidive, Munich, 1911.
2. Rumpf: Die syphilitischen Erkrankungen des Nervensystems, J. F. Bergmann, Wiesbaden, 1887.
3. Knorre: Deutsch. Klin., 1849, Nos. 6 and 7.
4. Lang. Vrtljschr. f. Dermat. u. Syph., 1881, p. 469.
5. Nonne: Syphilis und Nervensystem, S. Karger, Berlin, 1909.
6. Gros and Lancereaux. Des affections nerveuses syphilitiques, Paris, 1861.
7. Ravaut: Ann. de dermat. et syph., 1903, p. 537.
8. Fournier: La syphilis du cerveau, Paris, 1879.
9. Boidin and Weil: Presse méd., 1907, p. 681.
10. Mott: System of Syphilis, Vol. IV., London, 1910.
11. Williamson: Syphilis and Syphilitic Diseases of the Spinal Cord, Sherrett and Hughes, Manchester, 1899.
12. Finger: Wien. klin. Wchnschr., 1910, xxiii, 1667.
13. Mucha: Wien. klin. Wchnschr., 1911, xxiv, 1012.
14. Ehrlich: München. med. Wchnschr., 1911, lviii, 2481
15. Benario: Ueber Neurorezidive, Munich, 1911.

The occurrence of these nerve relapses after salvarsan is, in the experience of most observers, from 0.5 to 3 per cent. The figures of Finger, who has seen forty-four nerve relapses in 500 cases treated, remain unparalleled. The following tabulation gives the results in some of the large clinics:

Author	No. of Cases Treated	No. of Nerve Relapses
Desneux and Dujardin[16]	350	7
Rille[17]	200	3
Krausz[18]	345	5
Von Zeissl[19]	273	4
Frühauf[20]	478	3
Gennerich[20]	340	1
Krausz[18]	345	5
Simonyi[21]	300	0
Gibbard, Harrison and Cane[22]	392	1
Neisser[23]	2000	6
Scholtz[18]	700	3
Klingmuller[18]	1260	4
Schwarz[24]	*	5
Gérone and Gutmann[25]	300	13
Millan[26]	1200	5
Finger	500	44

* Not mentioned.

Such figures show undoubtedly that syphilitic meningitis is much more frequent than we have considered it in the past. Two possibilities arise: (1) that more careful observation has led to more frequent recognition; (2) that salvarsan in some way predisposes to the development of syphilis of the nervous system.

Numerous observers have called attention to the frequency of involvement of the nervous system in the early stages of syphilis. Jarisch[27] noticed the increased reflexes at this period. Fournier described a regional analgesia; Finger[28] himself, in 1881, called attention to the increased irritability of the reflexes during the period of the exanthem, followed by diminished excitability and, in some cases, by disappearance.

Lang,[4] in 1881, referred to the frequent headache, neuralgia and dizziness occurring in the secondary stage and suggested that they were signs of meningeal irritation. Schnabel[29] in the same clinic examined the eyes of forty patients in the secondary stage of syphilis and found in seven retinitis, chorioiditis or chorioretinitis; fourteen others showed some degree of retinal hyperemia.

Wilbrandt,[30] in Hamburg, examined the eye-grounds of 200 syphilitics in the early stages of the disease and found hyperemia thirty-eight times, neuroretinitis five times, retinitis once and retinal hemorrhage once. The frequency of disease of the internal ear in the early stages of syphilis has been noted by several authors.

Habermann,[31] in 1896, reported sixty-six cases of paralysis of the acoustic nerve due to syphilis, thirty-four of which appeared in the secondary stage of the disease. He pointed out the early period at which such lesions might appear. Of the thirty-four occurring in the secondary stage, three appeared on the day of the eruption and in only six was the disturbance of hearing first detected later than ten weeks after the exanthem. Mayer[32] in the same clinic has seen sixty-five examples of acoustic paralysis due to syphilis, of which thirty occurred in the first year.

Frey[33] has collected a large number of reports of cases of syphilitic disease of the middle ear from the literature. He considers the increased frequency of such lesions after salvarsan by no means proved.

The most important contribution to the subject of early involvement of the central nervous system in syphilis was made by Ravaut[34] in 1903. He examined the spinal fluid in 116 cases of secondary syphilis and found some degree of abnormality, either increased cells or increased protein content, in 67 per cent. In a subsequent paper he reports the examination of thirty-three patients in the secondary stage treated with salvarsan; in them he found abnormality of the spinal fluid in 85 per cent. He considers, therefore, that salvarsan increases the frequency of meningeal involvement. Both papers are open to criticism in that the methods employed in examination are not the most accurate, and in that Ravaut counts as abnormalities changes which the majority of authorities do not accept as being necessarily pathologic. The changes in many of the cases are sufficient, however, to show how frequently syphilitic involvement of the meninges does occur in the secondary period.

The degenerations of cranial nerves following the use of atoxyl, arsacetin and other organic arsenic preparations impressed people with a fear of a similar action for salvarsan. This fear was really unjustified because the chemical structure of salvarsan differs entirely from the earlier preparations. In these the arsenic was in the pentavalent form, while in salvarsan it is trivalent. Moreover, the phenyl-arsenic acid group, which Igersheimer has shown to be responsible for the neurotoxic action of atoxyl and similar compounds, is not present in salvarsan. This fear of a neurotoxic action of salvarsan led to a very careful examination and careful following up of patients treated with the drug, and resulted in the ophthalmologists and otologists seeing many more cases of early syphilis than ever before. In this lies in part, at least, the increased frequency of disturbances in sight and hearing in the early stages of syphilis noticed since the introduction of salvarsan. In this connection the figures of Werther[35] are interesting. Werther, in the past year, has seen twelve cases of meningitis in early secondary syphilis. Three of these had had no treatment, four had had mercury, and five had been treated with salvarsan. Similarly, Kren[18] reports having seen in one month two cases of meningitis in patients treated with mercury.

The supporters of the theory of an increased susceptibility of the nervous system due to salvarsan have advanced several hypotheses, none of which seems very acceptable. Finger considers that salvarsan injures the walls of the small cerebral vessels, leading to a *locus minoris resistentiæ* for syphilitic arteritis. This subsequently spreads and involves the nervous tissue. Other authors consider that salvarsan changes the reaction of the body to the syphilitic virus and use as a simile the occurrence of the so-called Thallmann's chancre on the skin. Others again consider that there is "an abolition

16. Desneux and Dujardin: München. med. Wchnschr., 1911, lviii, 1245.
17. Rille: Berl. klin. Wchnschr., 1910, xlix, 2281.
18. Cited by Benario: Wien. med. Wchnschr., 1912, lxii, 583.
19. Von Zeissl: Berl. klin. Wchnschr., 1911, xlviii, 1785.
20. Gennerich: 8. Bericht über Salvarsanbehandlung. S. 12, Berlin, 1911.
21. Simonyi: Cited by Benario. (See Note 18).
22. Gibbard, Harrison and Kane: Jour. Royal Army Med. Corps, January, 1912.
23. Neisser: Ueber moderne Syphilistherapie, Halle a. S. 1911.
24. Schwarz: St. Petersburg med. Ztschr., 1912, xxxvii, 99.
25. Gérone and Gutmann: Berl. klin. Wchnschr., 1911, xlviii, 461.
26. Milian: Bull. et mém. de la Soc. méd. d. Hôp. de Paris, 1912, xxviii, 326.
27. Jarisch: Cited by Mott. (See 10).
28. Finger: Ueber eine constante nervöse Störung bei florider Syphilis der secundärperiode, Vrtljschr. f. dermat. u. syph., 1881, p. 255.
29. Schnabel: Vrtljschr. f. dermat. u. syph., 1881, p. 469.
30. Wilbrandt: Cited by Schwarz. (See 24).
31. Habermann: Die luetischen Erkrankungen des Gehörorgans, Jena, 1896.
32. Mayer: Wien. klin. Wchnschr., 1911 xxiv, 381.
33. Frey: Wien. klin. Wchnschr., 1911, xxiv, 385.
34. Ravaut: Presse méd., 1912, No. 18. (Also see 7).
35. Werther: München. med. Wchnschr., 1911, lviii, 505.

of inhibiting substances" or "an increased supply of the food material necessary for growth." Ehrlich[14] has suggested that the sterilization of the rest of the body leads to increased development of the few spirochetes remaining in the central nervous system, inaccessible to salvarsan. He has used as an illustration the growth of bacteria occurring on culture plates. If many bacteria are planted, large numbers of very small colonies appear; if only a few bacteria are introduced, few colonies of large size occur.

At the hospital of the Rockefeller Institute we have seen during the past nineteen months six cases of secondary syphilitic meningitis. All of these patients had had salvarsan. Four cases occurred in our own series of salvarsan-treated patients, which contained thirty-two in the secondary stage of the disease, all but one of whom have now been followed for at least one year. At first sight the frequency of our cases of syphilitic meningitis, four in thirty-two secondary cases treated, appears as great as the figures given by Finger. Only one of the four patients, however, presents the typical picture of a nerve recurrence with paralyses of cranial nerves. In the other three cases, the signs of involvement of the nervous system were quite indefinite and the diagnosis could not have been made without the assistance of lumbar puncture. In addition to these four cases, we have had an opportunity of studying two patients (Cases 5 and 6), both typical examples of the so-called nerve recurrences, occurring in the practice of others, and referred to us for treatment.

CASE 1.—May 17, 1911: Chancre of the left index-finger. June 30, 1911: secondaries. Wassermann reaction ++. July 8: 0.5 gm. salvarsan intravenously. July 20: 0.2 gm. salvarsan. August: five injections of mercury salicylate. September 6: ringing in the ears, slight dizziness for one day; Wassermann reaction negative. September 9: 0.4 gm. salvarsan. October and November: five injections of mercury salicylate. November 24: vertigo, nausea, vomiting, ringing in the ears, deafness; stiffness of the muscles of the neck. December 8: unequal pupils, papillitis, nystagmus, right ear diminished air conduction, complete loss of bone conduction and facial paresis; Wassermann reaction negative. Lumbar puncture: fluid hazy, cell-count 575, Noguchi globulin ++. Wassermann reaction in spinal fluid 0.5 c.c. +. December 9: 0.4 gm. salvarsan. December 17: hearing improved, nausea and vertigo have disappeared. May 6, 1912: mercury to point of tolerance; patient feeling well; hearing improved; occasional tinnitus still present; Wassermann reaction negative.

In this patient the first symptom suggesting involvement of the nervous system appeared two and a half months after the secondary eruption, patient having had 0.7 gm. salvarsan and four mercury injections. Improvement under further salvarsan therapy was rapid.

CASE 2.—Dec. 27, 1910: primary. Feb. 7, 1911: secondaries of malignant type, headache, lancinating pain in the right ear, pains in the legs. Mercury by mouth for one month. April: severe pain about the right eye, dimness of vision, spots before the eyes, intense headache, tenderness of the scalp. Twenty inunctions of mercury. May 5, 1911: inequality of pupils, exaggerated reflexes; Wassermann reaction negative. May 8: 0.4 gm. salvarsan. May: four injections of mercury salicylate. June 10: 0.4 gm. salvarsan. August 1: general malaise, inability to work, headache, tenderness of the scalp, itching sensation over whole body. Five injections of 0.2 gm. salvarsan; complete disappearance of symptoms. October 4: headache, stabbing pain in left ear, numbness of the left side of the body; Wassermann reaction negative. October 6: lumbar puncture; cell-count 132, Noguchi globulin +, Wassermann reaction in spinal fluid, 0.1 c.c. —. October 7 to October 20: three injections of 0.2 gm. salvarsan. October 25 to October 30: dazed hysterical mental condition. November: two injections of 0.2 gm. salvarsan. November 18: lumbar puncture; cell-count 173, Noguchi globulin +, Wassermann reaction in spinal fluid, 0.4 c.c. —. May 23, 1912: has been taking mercury by mouth and has felt perfectly well since the beginning of January. Reflexes still exaggerated. Lumbar puncture refused.

In this case, the infection of the meninges almost certainly dates from the time of appearance of the secondary rash, and before any salvarsan had been administered. The headache, dimness of vision, spots before the eyes, lancinating neuralgic pain and exaggerated reflexes occurring at this time all indicate the probability of a meningitis being already present.

CASE 3.—July, 1911: sore throat, probably chancre of the tonsil, headache, nervousness and insomnia. August: secondaries. October 5: 0.5 gm. salvarsan. October 10: admission to the hospital; Wassermann reaction ++. Oct. 1, 1911, to Jan. 1, 1912: nine injections of 0.2 gm. and one of 0.3 gm. salvarsan. Marked improvement, mental depression has disappeared, headache much less frequent. Discharged. Jan. 1, 1912, to March 1, 1912: four mercury injections and mercury by mouth for two weeks. March 4, 1912: readmission to hospital; mental depression, general malaise, one small area of skin hyperesthesia; knee-jerks exaggerated. Lumbar puncture: cell-count 110, Noguchi globulin ±, Wassermann reaction in spinal fluid, 0.5 c.c. ++. March 4 to April 5: five injections of 0.3 gm. salvarsan. Improvement; disappearance of mental depression, no headache; lumbar puncture: cell-count 14, Noguchi globulin —, Wassermann reaction in spinal fluid, 0.5 c.c. —. April 5 to May 25: four injections of 0.3 gm. salvarsan and two injections of mercury. Feeling well, knee-jerks still very active.

In this patient, the signs of involvement of the nervous system were of the most trivial character, yet lumbar puncture showed an active syphilitic meningitis to be present. Headache, mental depression and exaggerated knee-jerks were the only symptoms at any time. It is significant that these same symptoms were present even before the appearance of the secondary exanthem and before any treatment had been administered.

CASE 4.—Oct. 15, 1910: primary. November 15: malaise, pains in the shoulders and in the ankles, indistinctness and blurring of vision. November 22: secondary rash. November 26: 0.6 gm. salvarsan intramuscularly. December 1: patient feeling well. December 30: complains again of "filminess" before the eyes and pain in the right ankle, stiffness of the muscles of the neck and some tenderness over both olecranon processes. Jan. 9, 1911: 0.5 gm. salvarsan intravenously. January 23: still has occasional attacks of filminess before the eyes. February 1 to April 1: six injections of mercury salicylate and eleven of enesol. April 21: general papular eruption, mucous patches, pains in ankles and elbows. May 10: 0.4 gm. salvarsan. June 19: Wassermann reaction negative. June 1 to August 15: ten injections of mercury salicylate and eight of mercuric chlorid. August 15: Wassermann reaction ++. September 15: mucous patches. September 29 to October 27: five injections of 0.2 gm. salvarsan. November 27: mucous patches, palmar and plantar papular syphilids, Wassermann reaction ++. December 22: itching sensation in the axillæ and down the sides of both thighs, blepharospasm, pain about the left ankle. December 1 to December 29: four injections of 0.3 gm. salvarsan. Jan. 1, 1912 to March 1: eight injections of mercury. March 5: hyperesthesia of both knees lasting two days. Patient noticed that his overcoat flapping against his knees hurt him. March 1 to March 29: five injections of 0.3 gm. salvarsan. March 29 to May 23: eight injections of mercury. May 23: lumbar puncture: cell-count 212, globulin ±, Wassermann reaction in spinal fluid, 0.4 c.c. ++. Wassermann reaction in the blood negative.

This is the most resistant case of syphilis we have seen. As soon as treatment was discontinued, the patient

immediately relapsed and after eighteen months of almost continuous treatment with mercury and salvarsan, he still has what is evidently an active meningitis. On reading back through the history, one is struck with the occasional headaches, skin hyperesthesia, paresthesia, blepharospasm, pains in the legs and filminess of vision, all symptoms probably referable to the nervous involvement and appearing at intervals from the beginning of the infection. Here again symptoms were noticed before the beginning of treatment which, in the light of subsequent knowledge, suggest involvement of the meninges, even at this early date.

Case 5.—May 1, 1911: primary. May 29: secondaries. June 9 to June 24: three injections of 0.5 gm. salvarsan. July 1 to August 15: six inunctions and twelve injections of mercury. August 19: stiffness of the muscles of the neck, lancinating headache, deafness in the left ear, dizziness, weakness of the left side of the mouth. September 23: admission to the hospital; unequal pupils, exaggerated reflexes. Lumbar puncture: fluid hazy, cell-count 1,074, Noguchi globulin ++, Wassermann reaction in spinal fluid, 0.1 c.c. ++; Wassermann reaction in serum ++. September 28: 0.2 gm. salvarsan; immediate improvement. October 5: 0.2 gm. salvarsan; improvement continues. October 12: 0.2 gm. salvarsan. October 16: feels perfectly well, hearing in left ear only slightly impaired. Lumbar puncture: cell-count 118, Noguchi globulin +, Wassermann reaction in spinal fluid, 0.1 c.c. —. October 12 to November 29: seven injections of 0.2 gm. salvarsan. Wassermann reaction in blood +±. December 5: lumbar puncture: cell count 60, Noguchi globulin +, Wassermann reaction in spinal fluid, 0.5 c.c. +. December 7 to December 14: two injections of 0.2 gm. salvarsan. January, 1912: five injections of mercury salicylate. January 21: lumbar puncture: cell-count 9. February: four injections of mercury. March 1: general malaise, pains in arms and legs. Lumbar puncture: cell-count 40, Noguchi globulin +, Wassermann reaction in spinal fluid, 0.5 c.c. ± (?). March 9 to April 16; five injections of 0.3 gm. salvarsan and one of 0.4 gm. Wassermann reaction negative. April 18: lumbar puncture: cell count 11, Noguchi globulin ±, Wassermann reaction in spinal fluid, 0.5 c.c. —. May 7 to May 28; four injections of 0.3 gm. salvarsan. May 31: lumbar puncture: cell-count 8, Noguchi globulin —, Wassermann reaction in spinal fluid 0.5 c.c. —.

This is a typical example of the so-called nerve recurrences, paralyses of cranial nerves coming on three months after infection in a patient treated with salvarsan. In this case no sign of involvement of the nervous system can be made out in the earlier history. The curative effect of continued, intense salvarsan therapy in such cases of meningitis is well demonstrated. The patient has had 7 gm. of salvarsan in the course of the year.

Case 6.—Oct. 18, 1911: primary. No secondaries. November 15: severe frontal and vertical headache, pain in the eyes, tenderness of the scalp. November 28: 0.5 gm. salvarsan; headache disappeared. December 25: headache severe, deafness in the right ear. Jan. 22, 1912: 0.5 gm. salvarsan; gradual improvement. April 1: headache returning. April 11: admitted to hospital; pupils irregular, reflexes exaggerated: Wassermann reaction +. Lumbar puncture: cell-count 190, Noguchi globulin —±, Wassermann reaction in spinal fluid, 0.4 c.c. ++.

TABLE OF CASES OF SECONDARY SYPHILITIC MENINGITIS

Case Number	1	2	3	4	5	6
Primary	5/17/11	12/27/10	Not known	10/15/10	5/1/11	10/18/11
Secondaries	6/30/11	2/7/11	6/15/11	11/22/10	5/29/11	None.
First Nervous Symptom	Deafness, dizziness for one day. 9/10/11.	Headache, pain in the ear, tender scalp. 2/9/11.	Headache. 6/11.	Dimness of vision. 11/20/10.	Headache, deafness, facial paralysis. 8/19/11.	Headache, tender scalp. 11/15/11
Treatment Before First Nervous Symptom.	0.7 gm. salvarsan. 4 Hg injections.	Hg by mouth for 2 weeks.	None	None	1.5 gm. salvarsan. 6 Hg inunctions. 12 Hg injections.	None.
Date of First Lumbar Puncture	12/8/11	10/4/11	3/7/12	5/23/12	9/23/11	4/16/12
Cell-Count in Spinal Fluid	575	132	110	212	1074	190
Globulin in Spinal Fluid	++	+	+	+	++	+
Wassermann Reaction in Spinal Fluid.	0.5 c.c. +	0.1 c.c. —*	0.5 c.c. ++	0.4 c.c. ++	0.1 c.c. ++	0.4 c.c. ++
Wassermann Reaction in Blood at time of First Lumbar Puncture.	—	—	—	—	++	+
Treatment Before First Lumbar Puncture.	1.1 gm. salvarsan. 8 Hg injections.	1.8 gm. salvarsan. 4 Hg injections.	2.8 gm. salvarsan. 4 Hg injections.	5.4 gm. salvarsan. 33 Hg injections. 11 injections oncsol.	Same as above and 2 weeks' mixed treatment.	1.0 gm. salvarsan.
Date of Last Lumbar Puncture	Lumbar puncture refused.	Lumbar puncture refused.	6/11/12	First lumbar puncture only 2 weeks ago.	5/31/12	5/22/12
Cell-Count in Spinal Fluid			8		8	23
Globulin in Spinal Fluid			—		—	±
Wassermann Reaction in Spinal Fluid.			0.5 c.c. —		0.5 c.c. —	0.5 c.c. ++
Wassermann Reaction in Blood at Time of Writing.			—		—	++
Treatment Between First and Last Lumbar Puncture.			3.0 gm. salvarsan. 3 Hg injections.		5.5 gm. salvarsan. 9 Hg injections.	0.9 gm. salvarsan.

* Larger amounts of fluid not used at this date.

In the above table the date of first lumbar puncture marks the time at which definite suspicion of nervous involvement first arose, except in Cases 5 and 6, which were referred to us on account of their nervous symptoms and were lumbar punctured on admission.

The severe vertical and frontal headache, tenderness of the scalp and pain in the eyes before any treatment was given again suggest that the meningitis was then already present, in this case, even before the appearance of secondaries.

A review of these cases is instructive. In four of the six, symptoms referable to the nervous system were already present before salvarsan had been given, in two cases even before the appearance of secondaries. In four of the cases, although the indications point to an active meningitis having been present over a period of months, the symptoms were never obtrusive and only lumbar puncture revealed the nature of the process. The triviality of the symptoms which may accompany syphilitic infection of the meninges has been called attention to by

Schwarz, who noticed in several cases of nerve relapses, with improvement under treatment, complete euphoria, although examination of the spinal fluid showed that a high cell count and positive Wassermann reaction in the spinal fluid were still present. Hoffmann[36] has been able to produce a primary lesion in a monkey by inoculation of the spinal fluid of a case of early secondary syphilis, absolutely free from nervous symptoms. The beneficial result of continued intense salvarsan therapy, which has been noticed by all observers, is well illustrated in Cases 3, 5 and 6.

Syphilitic secondary meningitis, therefore, may occur early in the disease. It may be latent, causing no obtrusive symptoms, over long periods. It is a more frequent complication than we have commonly considered. The so-called nerve recurrences after salvarsan are examples of such a meningitis. In most cases the infection of the nervous system has probably already occurred before the institution of treatment. They represent the development of the disease in a region notoriously difficult to reach with curative agents. The contention that salvarsan predisposes in any way to the development of disease of the nervous system has not yet been established.

FOUR YEARS' EXPERIENCE WITH THE WASSERMANN REACTION IN PRACTICE

A FURTHER REPORT ON CASES TREATED FROM THE STANDPOINT OF THE WASSERMANN REACTION WITH MERCURY ALONE, WITH SALVARSAN ALONE AND BY THE COMBINED METHOD (SALVARSAN AND MERCURY), INCLUDING A PRELIMINARY REPORT ON THE NOGUCHI LUETIN SKIN REACTION *

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Previous to the year 1907, there was no method of determining when a patient was cured of syphilis. Biologic treatment begun at this time was only experimental, yet it offered a tangible guide in the treatment of this class of cases.

Before the advent of the Wassermann reaction, when a patient placed himself under treatment, he asked, "How long shall I have to be treated before I am considered cured?" He was told that if he was treated for one and one-half years after all clinical symptoms had disappeared, he could consider himself cured and free to marry.

We all know that with the method then in vogue, i. e., that of chronic intermittent treatment, this was a mistake, except in a relatively few cases. Every one of us who has had any experience at all, and especially those of us who have had a large experience with the Wassermann reaction in clinical practice, know how many cases still showed a positive reaction with or without symptoms. A conservative estimate would be one in four cases that showed a negative reaction without parasyphilitic or nervous manifestations, or in other words, a biologic cure.

Attention has been called to the specificity of the reaction by syphilographers and serologists in all civilized countries in their endeavor to confirm the findings of Wassermann, Neisser and Bruck. Since its introduction there has been no biologic test that has been so universally applied, and likewise so universally abused, as the Wassermann, especially when the laboratory worker failed to confirm the clinician's diagnosis, and as a consequence it has gradually come into disrepute in some quarters. This is more manifest since we know that the reaction is lipoidal in nature, and not a true antibody test, more especially since the advent of salvarsan, as a positive reaction may change to a negative and reverse in a relatively short time.

The organ extract that was at first advocated was prepared by macerating the liver from a case of congenital syphilis in salt solution, and it was considered that in this way an extract containing the specific receptors of the *Spirochæta pallida* (antigens) was obtained. This combined with the corresponding antibodies in the syphilitic's serum and caused fixation of complement.

Later it was discovered by Porges,[1] Meier,[1] Landsteiner,[2] Mueller,[2] Poetzl,[2] Levaditi,[3] Yamanouchi[3] and Noguchi[4] that alcoholic extracts of normal as well as syphilitic tissues had the property of deviating complement in the presence of syphilitic serum.

Consequently it appeared that the reaction did not correspond in a biologic sense to that between an antigen and antibody, but was entirely lipotropic. This has recently been most conclusively proved by Noguchi in his cultivation of the *Spirochæta pallida*. He showed that syphilitic serums giving the positive Wassermann reaction by means of lipoidal antigens did not bind complement with the same affinity when the lipoids were replaced by an extract or emulsion of *Spirochæta pallida*, and that it was not possible to intensify the ordinary Wassermann reaction in syphilitic serums by adding to the extract an emulsion of the *Spirochæta pallida*, except in some cases following severe treatment, especially after salvarsan, where we certainly assume a large number of antibodies to be present in a patient's serum.

The question arises then of what specific value as an aid in the diagnosis and treatment of syphilis is this test, especially since it is so vacillating as to be present sometimes in narcosis, scarlet fever, pneumonia, leprosy, tumors, tuberculous cachexia, Hodgkin's disease, myeloid leukemia, frambesia, recurrent fever and occasionally in lead-poisoning, and in certain other protozoal diseases. One can readily see it permits the conclusion that either it is not a specific phenomenon, or that a specific process may be simulated by other phenomena.

W. H. Manwaring[5] says that "the prevailing explanation that the Wassermann reaction depends on a complement fixation by specific antibodies has only the value of a working theory," and he maintains that:

1. It is possible to produce similar phenomena in which the presence of such antibodies is excluded, as Noguchi has done.
2. The hypothesis that this phenomenon depends on a destruction of complement by proteolytic enzymes may be supported by an equally good explanation.

From the latter the evident specificity of the reaction gains in value and points to the existence of factors in the territory of immunochemistry which have hitherto not been considered. Bauer and Hirsch[6] show the

36. Hoffmann: Dermat. Ztschr., 1906, xiii, 561.

* Read in the Symposium on Syphilis in the Section on Genito-Urinary Diseases of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912

1. Porges and Meier: Berl. klin. Wchnschr., 1908, p. 731.
2. Landsteiner, Mueller and Poetzl: Berl. klin. Wchnschr., 1908, p. 86.
3. Yamanouchi: Compt. rend. Soc. de biol., Paris, 1907, lxiii, 187.
4. Noguchi: Jour. Exper. Med., 1909, xi, 84.
5. Manwaring: Ztschr. f. Immunit. Frsch. u. exper. Therap., 1909, iii, No. 4.
6. Bauer and Hirsch: Wien. klin. Wchnschr., 1912, No. 4, p. 155.

TABLE SHOWING RESULTS OF WASSERMANN REACTION IN

No. of Case, Age & Sex	Diagnosis	Duration	Previous Treatment	Wassermann Before Salvarsan	Salvarsan: 1 Date, Gm., Method	2 Date, Gm., Method	3 Date, Gm., Method	4th, 5th, 6th Date, Gm., Method
1—34, M.	Chancre rectum.	4 wks.	None.	2/ 1 /11, +	2/1/11, 0.6, intravenous.	2/6/11, 0.6, intramuscular.	5/20/11, 0.6, intravenous.	.....
2—28, M.	Chancre tonsil w. secondaries.	6 wks.	None.	11/ 5 /10, +	11/7/10, 0.5, intramuscular.	1/23/11, 0.5 intramuscular.	.....	.....
3—20, M.	Chancre penis.	5 da.	None.	4/28/11, —	4/29/11, 0.6, intravenous.	5/4/11, 0.6, intramuscular.	7/1/11, 0.6, intravenous.	7/24/11, 0.6, intravenous.
4—18, M.	Chancre penis.	3 wks.	None.	11/28/10, —	11/28/10, 0.5, intramuscular.	12/11/11, 0.5, intramuscular.	.....	.....
5—26, M.	Secondaries early.	8 mo.	Internal	10/26/10, +	11/28/10, 0.5, intramuscular.	12/1/10, 0.6, subscapular.	4/29/11, 0.6, intravenous.	4th, 6/12/11; 5th, 10/18/11; 6th, 1/23/12; ea. 0.6 intrav.
6—36, M.	Secondaries.	4 yrs.	Internal & rubbings.	12/ 1 /10, +	12/13/10, 0.6, intramuscular.	4/4/11, 0.6, intramuscular.	.....	.....
7—25, M.	Second., etc.	2 yrs.	Internal & rubbings.	11/23/10, +	11/24/10, 0.5, intramuscular.	1/2/11, 0.5, intramuscular.	1/12/12, 0.6, intravenous.	.....
8—40, M.	Secondaries.	4 yrs.	Internal & rubbings.	16/21/10, +	10/21/10, 0.5, intramuscular.	2/13/11, 0.5 intramuscular.	8/7/11, 0.6, intravenous.	4th, 12/8/11; 5th, 4/26/12; ea. 0.6 intrav.
9—28, M.	Secondaries.	5 yrs.	Internal & rubbings.	2/ 5 /11, +	2/7/11, 0.6, intramuscular.	4/25/11, 0.6, Intravenous.	6/5/11, 0.6, intravenous.	8/19/11, 0.6, intramuscular.
10—32, M.	Secondaries early.	6 mo.	Internal & rubbings.	1/12/11, +	1/12/11, 0.6, intramuscular.	3/23/11, 0.6, intravenous.	8/11/11, 0.6, intravenous.	.....
11—35, M.	Secondaries.	2 yrs. & 6 mo.	Internal & rubbings.	11/15/10, +	11/17/10, 0.6, intramuscular.	1/12/11, 0.6, intramuscular.	12/1/11, 0.6, intravenous.	.....
12—30, M.	Secondaries.	6 wks.	None.	11/11/10, +	11/18/10, 0.5, intravenous.	11/21/10, 0.6, intramuscular.	8/11/11, 0.6, intravgnous.	4th, 11/24/11; 5th, 3/1/12; ea. 0.6 intrav.
13—23, M.	Secondaries.	8 mo.	Internal	10/19/10, +	1/9/11, 0.6, intramuscular.	4/18/11, 0.6, intramuscular.	8/25/11, 0.6, intravenous.	11/14/11, 0.6, intravenous.
14—40, M.	Secondaries.	2 yrs.	Internal & rubbings.	11/ 3 /10, +	11/4/10, 0.5, intramuscular.	1/17/11, 0.6, intramuscular.	7/24/11, 0.6, intravenous.	.....
15—38, M.	Secondaries.	5 mo.	Internal & injections.	11/11/10, +	11/24/10, 0.5, intramuscular.	5/9/11, 0.6, intramuscular.	.....	.....
16—21, M.	Secondaries.	4 mo.	Internal	4/23/11, +	4/24/11, 0.5, intramuscular.	6/7/11, 0.6, intramuscular.	1/9/12, 0.6, intravenous.	4/26/12, 0.6, intravenous.
17—22, M.	Secondaries.	6 wks.	None.	9/ 9 /11, +	9/11/11, 0.6, intravenous.	10/30/11, 0.6, intravenous.	12/23/11, 0.6, intravenous.	3/4/12, 0.6, intravenous.
18—36, M.	.....	4 yrs.	Internal & rubbings.	11/26/11, +	1/18/11, 0.6, intramuscular.	3/18/11, 0.6, intravenous.	8/2/11, 0.6, intramuscular.	.....
19—32, M.	Secondaries.	3 mo.	Internal	10/17/11, +	10/23/11, 0.6, intramuscular.	12/8/11, 0.6, intramuscular.	1/26/12, 0.6, intravenous.	.....
20—31, M.	Secondaries.	6 yrs.	Internal rubbings & injections.	10/18/10, +	10/20/10, 0.5, intramuscular.	12/11/10, 0.6, intramuscular.	9/2/11, 0.6, intravenous.	3/9/12, 0.6, intravenous.
21—38, M.	Secondaries.	14 mo.	Internal	11/ 3 /10, +	11/11/10, 0.5, intramuscular.	1/17/11, 0.6, intramuscular.	.....	.....
22—45, M.	Secondaries.	9 mo.	Int., rubbings salv. subcut.	5/23/11, +	5/25/11, 0.6, intravenous.	6/29/11, 0.6, intravenous.	11/24/11, 0.6, intravenous.	.....
23—26, F.	Secondaries.	6 mo.	Internal	.....	5/18/11, 0.6, intramuscular.	8/4/11, 0.6, intravenous.	.....	.....
24—20, F.	Secondaries.	5 mo.	Internal & injections.	10/18/10, +	10/18/10, 0.5, intramuscular.	11/30/11, 0.5, intramuscular.	.....	.....
25—22, M.	Secondaries.	4 mo.	Internal	3/10/11, +	3/13/11, 0.5, intramuscular.	5/8/11, 0.6, intramuscular.	7/7/11, 0.6, intravenous.	.....
26—45, M.	Gumma.	No history.	None.	4/18/11, +	4/20/11, 0.6, intramuscular.	6/../11, 0.6, intravenous.	10/../11, 0.6, intravenous.	.....
27—32, M.	Latent.	6 yrs.	Internal.	3/10/11, +	3/18/11, 0.6, intramuscular.	6/12/11, 0.6, intramuscular.	11/17/11, 0.6, intravenous.	3/18/12, 0.6, intravenous.
28—30, F.	Latent.	4 yrs.	Internal.	12/15/11, +	2/11/11, 0.5, intramuscular.	6/12/11, 0.5, intramuscular.	11/17/11, 0.5, intravenous.	3/18/12, 0.5, intravenous.
29—26, M.	Latent.	5 yrs.	Internal & rubbings.	5/25/11, +	5/25/11, 0.6, intramuscular.	7/28/11, 0.6, intravenous.	9/22/11, 0.6, intravenous.	4th, 1/22/12; 5th, 4/22; ea. 0.6, intrav.
30—48, M.	Latent.	12 yrs.	Internal & rubbings.	7/27/11, +	8/4/11, 0.6, intramuscular.	9/23/11, 0.6, intramuscular.	1/23/12, 0.3, intravenous.	1/27/12, 0.3, intravenous.
31—34, M.	Latent.	10 yrs	Internal & rubbings; severe.	5/ 1 /11, +	5/19/11, 0.6, intramuscular.	9/22/11, 0.6, intravenous.	.....	.....
32—36, M.	Latent.	12 yrs.	Internal & rubbings.; severe.	1/10/11, +	1/12/11, 0.6, intramuscular.	3/9/11, 0.6, intramuscular.	7/14/11, 0.6, intravenous.	4th, 9/15/11; 5th, 1/26/12; ea. 0.6 intrav.
33—38, M.	Latent.	8 yrs.	Internal & injections.	6/22/11, +	6/29/11, 0.6, intramuscular.	8/25/11, 0.6, intravenous.	11/24/11, 0.6, intravenous.	4th, 3/20/12, 0.5; 5th, 5/4/12, 0.6, intrav.
34—36, M.	Latent.	12 yrs.	Internal & rubbings.	2/ 9 /11, +	2/13/11, 0.6, intramuscular.	5/4/11, 0.6, intramuscular.	1/15/12, 0.6, intravenous.	.....
35—25, M.	Latent.	4 yrs.	Internal & rubbings.	5/18/11, +	5/19/11, 0.6, intramuscular.	8/28/11, 0.6, intramuscular.	11/10/11, 0.6, intravenous.	4th, 2/24/12, 5th, 5/6/12, ea. 0.6 intrav.
36—28, M.	Latent.	4 yrs.	Internal. & rubbings.	1/ 5 /11, +	1/5/11, 0.6, intramuscular.	3/5/11, 0.6, intramuscular.	10/21/11, 0.6, intravenous.	3/7/12, 0.4, intravenous.
37—32, M.	Latent.	1 yr.	Salv. intrav. yr. before; no other treat.	6/ 9 /11, +	6/21/11, 0.6, intramuscular.	8/15/11, 0.6, intramuscular.	10/27/11, 0.6, intravenous.	12/18/11, 0.6, intravenons.
38—28, M.	Latent.	4 yrs.	Internal. & rubbings.	1/23/11, +	2/16/11, 0.6, intramuscular.	7/24/11, 0.6, intravenous.	11/3/11, 0.6, intravenous.	.....
39—27, M.	Latent.	6 yrs.	Internal & rubbings.	3/16/11, +	12/9/10, 0.6, intramuscular.	4/20/11, 0.6, intravenous.	.....	.....
40—32, M.	Latent.	4 yrs.	Vigorous rubbings.	11/13/10, +	11/17/10, 0.5, intramuscular.	1/12/11, 0.5, intramuscular.	10/30/11, 0.6, intravenous.	.....
41—30, F.	Latent.	4 yrs.	Rubbings & internal.	10/26/10, +	1/17/11, 0.6, intramuscular.	3/16/11, 0.6, intramuscular.	.....	.....
42—29, M.	Latent.	8 yrs.	Rubbings & internal.	2/20/11, +	2/23/11, 0.6, intramuscular.	9/15/11, 0.6, intravenous.	.....	.....
43—26, M.	Latent.	3 yrs.	Rubbings & salvarsan	1/23/11, +	5/28/11, 0.6, intravenous.	7/28/11, 0.6, intravenous.	10/22/11, 0.6, intravenous.	4/10/12, 0.6, intravenous.
44—28, M.	Latent.	7 yrs.	Rubbings & internal.	5/ 4 /11, +	5/4/11, 0.6, intramuscular.	6/19/11, 0.6, intravenous.	9/2/11, 0.6, intravenous.	12/22/11, 0.6, intravenous.
45—26, F.	Latent.	5 yrs.	Rubbings & internal.	5/18/11, +	5/18/11, 0.5, intramuscular.	7/3/11, 0.6, intramuscular.	10/20/11, 0.6, intravenous.	1/15/12 intravenous.
46—30, M.	Latent.	4 yrs.	Internal.	4/14/11, +	5/14/11, 0.6, intravenous.	5/20/11, 0.6, intramuscular.	11/11/11, 0.6, intravenous.	.....
47—42, M.	Incipient tabes.	1 yr	Internal.	11/28/10, +	1/9/11, 0.6, intramuscular.	3/5/11, 0.6, intramuscular.	10/16/11, 0.6, intravenous.	1/13/12, 0.6, intravenous.
48—45, M.	Cerebrospinal syphilis	2 yrs.	Internal.	2/ 5 /11, +	2/6/11, 0.6, intramuscular.	5/1/11, 0.6, intravenous.	.....	.....

FORTY-EIGHT CASES OF SYPHILIS TREATED WITH SALVARSAN

Wassermann After Salvarsan				Other Treatment	Last Wassermann	Present Condition
1	2	3	4th, 5th, 6th.			
2/14/11, —	5/ 9 /11, —	8/ 2 /11, —	10/31/11, —	Rubbings and internal treatment; vigorous.	4/23/12, —	No symptoms since primary sore.
11/28/10, +	1/23/11, —	5/ 9 /11, —	... .	None.	3/13/12, —	No symptoms since primary sore.
6/10/11, —	10/31/11, —	2/20/12, —	.....	Rubbings for two months, continuous and vigorous.	4/20/12, —	No symptoms since primary sore.
1/23/11, —	5/ 1 /11, —	8/ 1 /11, —	.....	None.	3/20/12, —	No symptoms since primary sore.
10/22/10, +	1/23/11, +	3/10/11, +	4th, 5/1/11, +; 5th, 5/25/11 +; 6th, 6/30/11,—	Rubbings; vigorous.	1. 9 /12,—	No symptoms since primary sore.
1/11/11, +	8/ 1 /11, —	12/ 8 /11, —	.....	Rubbings; vigorous; enesol.	3/ 5 /12, —	No symptoms since primary sore.
11/28/10, +	1/11/11, +	3/21/11, +	.....	None.	1/ 9 /12. —	No symptoms since primary sore.
2/11/11, +	8/ 7 /11, +	12/ 7 /11, +	3/ 2 /12, +	Rubbings and internal; vigorous.	4/29/12, —	No symptoms since primary sore.
7/ 7 /11, +	.....	.....	.....	Rubbings and internal; vigorous.	3/15/12. +	Squamous lesion still present on hands.
3/ 2 /11, —	8/ 9 /11, —	.....	.....	Rubbings and internal; vigorous.	4/24/12, —	No symptoms.
1/11/11, +	3/18/11, +	9/27/11, —	.....	None.	11/28/11, —	No symptoms.
11/28/10, +	12/15/10, +	3/ 8 /11, +	4th, 9/18/11, —; 5th, 11/28/11,—	Rubbings and internal.	3/ 2 /12, —	No symptoms.
8/23/11, —	.....	.....	.....	Rubbings; vigorous.	2/12/12, —	No symptoms.
1/17/11, —	3/ 6 /11, —	7/24/11, —	.....	None.	12/ 1 /11, —	No symptoms.
.....	.....	.....	.....	.....	2/ 5 /12, —	.....
9/ 8 /11, —	.....	.....	.....	Rubbings and internal.	1/23/12, —	No symptoms.
10/30/11, +	12/24/11, —	.....	.....	Rubbings.	3/ 3 /12, —	No symptoms.
8/22/11, —	.....	.....	.....	Rubbings.	1/16/12, —	No symptoms.
12/ 7 /11, +	1/16/12, —	.....	.....	Rubbings.	4/19/12, —	No symptoms.
11/11/10, +	12/ 1 /10, +	.....	.....	Rubbings and internal.	3/ 8 /12, +	No symptoms.
4/ 6 /11, +	8/10/11, —	.....	.....	.....	.....	Reports no recurrence.
11/24/11, —	.....	.....	.....	Rubbings; vigorous.	.....	Reports no recurrence
8/ 2 /11, +	9/22/11, —	.....	.....	Rubbings.	13/22/12, —	No symptoms.
11/11/10, +	12/ 1 /10, +	.....	.....	None.	3/ 3 /12, +	No symptoms.
7/ 7 /11, +	.....	.....	.....	Rubbings; vigorous.	.....	No symptoms.
.....	.....	.....	.....	Hg injections; rubbings.	4/23/11, —	No symptoms.
11/17/11, —	.....	.....	.....	Rubbings; vigorous; internal.	3/19/12, —	No symptoms.
3/11/11, +	.....	.....	.....	Rubbings and internal.	3/19/12, —	No symptoms.
8/ 1 /11, +	9/26/11, —	1/23/12, —	.....	Rubbings.	4/22/12, —	No symptoms.
9/22/11, +	12/13/11, +	1/23/12, —	... .	Rubbings; vigorous.	5/ 1 /12, —	No symptoms.
9/22/11, —	.....	.....	.....	None.	4/19/12, —	No symptoms.
2/18/11, +	4/22/11, +	8/ 7 /11, —	4th, 9/14/11, —; 5th, 12/7/11, —	Rubbings; vigorous.	1/26/12, —	No symptoms.
8/30/11, —	11/29/11, +	2/23/12, —	.....	Rubbings; vigorous.	3/ 1 /12, —	No symptoms.
2/27/11, +	5/ 4 /11, +	6/27/11, —	.....	Rubbings and internal.	1/15/12, —	No symptoms.
8/30/11, +	10/20/11, +	2/ 6 /12, —	.....	Rubbings; vigorous.	5/ 4 /12, —	No symptoms.
3/ 2 /11, +	6/27/11, —	10/20/11, —	.....	Rubbings; vigorous.	3/ 8 /12, —	No symptoms.
9/12/11, —	12/19/11, —	.....	.....	Rubbings; vigorous.	3/ 8 /12, —	No symptoms.
5/ 1 /11, +	8/25/11, —	.....	.....	Rubbings and internal.	11/ 7 /11, —	No symptoms.
4/20/11, —	6/14/11, —	.....	....	Rubbings.	12/ 1 /11, —	No symptoms.
1/ 8 /11, +	4/22/11, —	9/27/11, —	.. ..	None.	10/30/11, —	No symptoms.
3/24/11, +	1/30/12, —	.....	.....	None.	4/20/12, —	No symptoms.
9/12/11, +	9/22/11, +	1/30/12, —	.....	None.	4/15/12, —	No symptoms.
7/27/11, +	9/12/11, —	12/ 7 /11, +	.....	Rubbings; vigorous.	4/25/12, —	No symptoms.
6/22/11, +	9/ 2 /11, —	.....	.....	Rubbings; vigorous.	12/22/11, —	No symptoms.
7/ 7 /11, +	10/21/11, —	.....	.....	Rubbings; vigorous.	1/16/12, —	No symptoms.
10/21/11, +	.....	.....	.....	Rubbings.	2/23/12, +	No symptoms.
2/23/11, +	7/ 7 /11, +	10/16/11, —	.....	Rubbings; vigorous.	1/ 9 /12, —	No symptoms.
4/28/11, +	7/ 7 /11, +	11/14/11, +	.....	Internal and rubbings.	5/ 6 /12, —	Gradual improvement of symptoms.

importance of the globulins for the occurrence of the Wassermann.

In several cases they saw a positive Wassermann with the albumin-containing urine of syphilitics and found that the intensity of the reaction stood in indirect relation to the globulin-content; further, that the globulins which had been separated from the urine showed a positive Wassermann more or less intense according to the concentration. The albumins of luetic urine and the urinary globulins of non-luetic urine did not prevent hemolysis.

That the serum-globulins are of importance for the occurrence of the Wassermann has already been asserted by Landsteiner and Mueller.[7] G. Peritz[8] has found that the Wassermann can be made negative temporarily by lecithin injections, and when a serum with a positive Wassermann changes to a negative the organic content of lecithin will be found increased; he further asserts that the reaction may be negative even when the luetic virus is circulating in the blood. In such cases a high lecithin content will be found.

Elias, Neubauer, Porges and Salomon[9] conclude from the results of their observations that the Wassermann reaction is a colloidal reaction between certain hydrophil colloids and albumins which are to be classed with globulins, which possess only slight stability in luetic serum, and therefore cause a more marked precipitation.

Our older and more conservative friends continually remind us that it will be many years before we can substantiate this so-called biological treatment of syphilis. This is without doubt true, but two things are certain: (1) that the practice of this biological treatment can only do lasting good for the patient; (2) that the management of syphilis without this systematic examination of the blood leads only to recurrence and complications; at least this has, in a great measure, been our experience in the past.

In the summer of 1908, following the plan of Neisser,[10] Hoene,[11] Boas,[12] Purkhauer[13] and others, I began a systematic examination of my private cases then under treatment for syphilis, and found that practically all gave a Wassermann positive. Believing then, as we do now, that this surely means a focus of spirochetes somewhere in the body, I began to use a more energetic method of treatment, and continued to make biologic tests from time to time, with the following conclusions:

1. The longer a given case was infected with syphilis, the harder it was to obtain a negative reaction.

2. The earlier a case was diagnosed, the easier it was to obtain and maintain the negative reaction.

3. Those cases that came under observation before the Wassermann was positive were more easily kept in the negative for all time than those that came under observation after the Wassermann was positive.

In June, 1910,[14] I gave a preliminary report of fifty-seven cases treated after the biologic method with mercury, to which I refer for my classification of cases.

In the fall of 1910, having obtained a quantity of salvarsan for experimental use, I immediately treated all my cases with the new specific excepting those that had early obtained a negative reaction and were progressing satisfactorily under mercury. These include two cases in Group 1, A, chancre, before the Wassermann reaction was positive. These cases were treated for one and one-half years vigorously all the time with a negative test Both have remained free from clinical symptoms, biologic tests are negative and there has been no treatment for eighteen and fourteen months respectively.

In Group 1, B, early secondaries, after the Wassermann was positive, only two cases succeeded in getting a negative test and maintaining it.

In Group 3, apparently cured, of the seven cases reported, three have maintained a negative test, one has relapsed and three have not been heard from.

In February, 1911, twenty-eight cases were reported[15] in which two injections of salvarsan were given intramuscularly—in the alkaline solution (Alt, Lesser technic), the second being given six to eight weeks after the first regardless of whether the Wassermann had become negative or not. These include Cases 2, 4, 7, 11 and 14 in the accompanying table. I have no doubt that other cases that came under observation at this time could have maintained the same course, but as these were private cases and salvarsan a new specific of unknown potency, an additional intravenous injection was given for safety's sake.

The accompanying table contains a report of forty-eight cases including primary, secondary, tertiary, latent (only manifest by a positive Wassermann), one case of tabes and one case of lateral sclerosis, both of the latter coming under observation early.

All cases have been under observation from eleven months to one and one-half years; all have had two or more injections, one case six; all except Cases 2, 4, 7, 11, 14, 24, 31, 40, 41, and 42 have had the combined treatment (mercury and salvarsan). In the majority of cases rubbings and internal treatment (potassium iodid) produced a negative reaction (except Cases 9, 20, 24 and 46). The longest negative reaction dates from Nov. 28, 1910, the shortest only from a few weeks. All the patients are in excellent physical condition and without symptoms except Patients 9 and 48; there have been no complications beyond those previously reported (induration and abscess).

METHODS OF ADMINISTERING SALVARSAN

Since its introduction I have given 462 injections. The methods employed have been: (1) intravenous (alkaline solution); (2) intramuscular (alkaline and monacid solution); (3) intramuscular (suspended in iodipin—iodin and sesame oil 25 per cent.). I have discarded the intramuscular suspension in oil as the least productive of biologic and clinical results, notwithstanding the fact that it can be given in the office and is followed by practically no pain.

In the intravenous and intramuscular alkaline solution injections, each case should be a law unto itself. The plan of treatment which I am following is as follows:

In primary syphilis, whether the Wassermann is negative or positive, an intravenous injection of 0.6 gm. of salvarsan is given, followed in four or five days by 0.6 gm. intramuscularly; then two months of continuous mercury rubbings, followed by two more intravenous injections two weeks apart. This, I think, is sufficient for a cure.

In secondary and tertiary syphilis, I prefer to give two intramuscular injections at first, then all subsequent treatment intravenously, alternating the injections with mercury rubbings, preferably fifty at a series.

7. Landsteiner and Mueller: Wien. klin. Wchnschr., 1908, p. 1076.
8. Peritz: Zeitschr. f. exper. Path. u. Therap., 1911, viii, 255.
9. Elias, Neubauer, Porges and Salomon: Wien. klin. Wchnschr., 1908, No. 21.
10. Neisser: München. med. Wchnschr., 1909, May 25, lvi, 1037.
11. Hoene: Berl. klin. Wchnschr., 1909, May 10, xlvi, 862.
12. Boas: Berl. klin. Wchnschr., 1909, March 29, xlvi, 577.
13. Purkhauer: München. med. Wchnschr., 1909, April 6, lvi, 697.
14. Corbus: The Journal A. M. A., Sept. 3, 1910, p. 849.
15. Corbus: The Journal A. M. A., Feb. 25, 1911, p. 566.

I fully appreciate the great storm of disapproval that has spread over the country against the intramuscular injection of the substance in the alkaline solution method, but when I look over my results, I cannot help but be impressed with the method as being superior as far as biologic results are concerned. This method is more simplified by the use of neo-salvarsan in a watery solution. In 15 c.c. of water 0.5 gm. is distinctly neutral and followed by scarcely any pain at all; at least this has been my experience during the last month.

In latent syphilis and syphilis of the nervous system I prefer to give a good full course of mercury first, as an intravenous injection given at this time has very little value, for the spirochetes are so firmly intrenched that the salvarsan washes through the blood stream without coming in contact with them, and does only a relatively small amount of good.

CURABILITY OF SYPHILIS AND THE NOGUCHI REACTION

To say that no syphilitic can be cured would be as absurd as that every syphilitic patient can be cured.

The curability of syphilis depends on making a prompt diagnosis, for the earlier a case comes under observation, the easier it is to effect a cure. That the biologic method offers the best means of controlling the treatment of the disease there can be no question.

Unfortunately, the tendency is to give too little treatment and to stop when the first negative reaction is reached. Under mercury therapy alone I treated all my cases with the negative reaction for eighteen months just as vigorously as when the Wassermann was positive. Under the new therapy (salvarsan and mercury) I treat all my cases except those that come under observation with a negative Wassermann (primary syphilis) at least nine months after the negative goal is reached, giving 150 rubbings of mercury and at least two intravenous injections of salvarsan.

The Noguchi cutaneous reaction, while positive in all cases of tertiary and congenital syphilis, may be of value as a diagnostic aid in bridging over the gap between the first negative test and the so-called cure. In thirty of my cases of syphilis under treatment a positive luetin was obtained in nine. It appears that by the application of this method it may be possible to show immediately whether a given patient is cured, for if he were not cured we assume that there would be protein substances in the blood derived from split toxins or antibodies from killed spirochetes, and thereby designated by a positive luetin test.

Reports following these observations on my cases have appeared elsewhere, and others will be added later.

CONCLUSIONS

The Wassermann reaction offers the best and most efficient guide in the management of syphilitic cases.

Results can be obtained with mercury alone and salvarsan alone, but are more quickly achieved by the combined method (salvarsan and mercury).

Treatment should be continued vigorously during the negative phase if we wish for a permanent result.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. ELLIS, CORBUS AND NOGUCHI

DR. B. A. THOMAS, Philadelphia: My experience with salvarsan given intramuscularly and intravenously, comprising about 200 cases, has resulted in the following statistics: Of the patients who have received one or more injections of salvarsan, about 80 per cent. have continued to show the Wassermann reaction as positive. Of those who were on mercury and who received salvarsan, one or more doses, 60 per cent. have still continued to show a positive Wassermann. On the other hand, in the patients who have been given salvarsan intravenously and then have been subsequently put on mercury, the percentage of positive reactions has been as low as 40 per cent. The cases in which a cure has been obtained, presumably so far as non-appearance of secondaries is concerned and absence of Wassermann reaction, some of which have been observed now for about eighteen months, have been those in which the drug was given before the second week of the chancre, and practically all cases in which the drug was given before the first week of the chancre.

I have great confidence in the Wassermann reaction with respect to the so-called one-unit system, which I have repeatedly demonstrated, having previously used the two-unit system. The disease has proved positive many times by the use of the one-unit system when by the use of the two-unit system it has been negative.

DR. H. J. NICHOLS, Washington, D. C.: Salvarsan has been used in a great many other conditions than syphilis, and does not produce any of the nervous relapses which we occasionally see in syphilis. We know that atoxyl may damage the eyes in any disease, but this is not the case with salvarsan. For instance, in yaws, which is due to a spirochete somewhat related to the spirochete of syphilis, a large number of cases (500 in Trinidad) have been treated with salvarsan, and in none were there complications of the retina or the ear or any paralysis of the facial nerve. This is also true in the treatment of relapsing fever. I think we are perfectly safe in concluding that these nervous relapses have a syphilitic basis, and that they are not due solely to the drug. I do think they are more frequent since the use of salvarsan, but this can be explained according to Ehrlich's ideas. He says that with the use of salvarsan there is a much more rapid destruction of the spirochetes, and also a much more rapid proliferation if any organisms are left; that is, under mercury or without any treatment there is more chance for antibodies to develop in the body than there is after salvarsan. With salvarsan there is almost complete sterilization of the body, something like a radical operation in which the drug is used as a knife to cut out the infecting agent; but a bit of the malignant tissue may be missed, which seems to grow again with increased virulence and to produce these nervous symptoms. The lesson is that in early cases in which there are headache and positive findings in the spinal fluid, treatment must be continued much longer than in other cases.

DR. HIDEYO NOGUCHI, New York: The biologic control of syphilis as advocated by Dr. Corbus is undoubtedly one of the most important guides for the treatment. While but little value may be attached to the disappearance of the Wassermann reaction, yet it is of great importance to carry out the treatment until a positive reaction is turned into a negative. The continuation of treatment in patients in whom the Wassermann had already disappeared and had remained absent for some time is also justified in view of the possibility of relapse. But it would be of great benefit for the physicians and patients if we could only tell when the treatment had been sufficient. In other words, we are in need of a method to determine a cure of this disease. In my opinion, the luetin reaction appears to become of some value in this respect. The fact that most cases of latent syphilis in which the Wassermann reaction and clinical symptoms are missing respond to the luetin test with remarkable constancy indicates the value of the luetin reaction in determining whether a given case, without any clinical or serologic signs of syphilis, is merely in latency or cured. I believe that syphilis can be detected at no matter what stage of the disease, when one resorts to the clinical symptoms, serologic examination and the luetin reaction. In some cases one or two of the three may be absent, but never every one of them. I am firmly convinced that if a patient suspected of being syphilitic shows no clinical signs and gives negative Wassermann and luetin reactions, he is non-syphilitic. From what has been said it follows that a biologic control of syphilis is no longer confined to the detection of the Wassermann reaction, but it

includes also a test for the specific allergic condition of the patients, as is done by the use of the luetin test.

DR. B. C. CORBUS, Chicago: Benario of Frankfort was the first observer to refute some of the assertions of Finger. He showed that a large percentage of neurorecurrences were in patients in whom the infection had been around the region of the head (the cephalic chancres), and he advises us to give energetic treatment in this class of cases in which there are headaches or anything that would simulate a meningitis. By following out that energetic line of treatment Dr. Ellis has probably cured a great many cases of syphilitic meningitis. I have been asked why I prefer the mercury rubbings in syphilis to any other method of treatment. In a former service I gave about 5,000 injections of mercury, preferably the soluble salts. It was common to see a prompt clearing up of the symptoms clinically, but the patients came back in two or three weeks with recurrences, especially on the mucous surfaces. Fournier long ago showed the danger of giving insoluble salts, as these become incysted. Cases of fatal mercury poisoning are reported in which the patient has fallen on the buttocks, thereby suddenly setting free sufficient mercury to cause toxic effects. Kromayer some years ago tried to introduce a mask to be worn by the patient at night. He believed that in this way he could introduce sufficient mercury into the patient through inhalation to effect a cure. This was not a success. Finger and others have shown that nurses working in wards in which patients were rubbed with mercury became salivated. In other words, they received an inhalation treatment. Following that plan, I have resorted to the following method: I have my patients rub the mercury on the back and front of the chest. They rub every day for thirty minutes. Twice a week they take a warm bath and scrub the mercury off. The patient wears a thin light-mesh undershirt continually under his other shirt, removing it only at the time of his baths. In this way I believe he obtains both an inhalation and an absorption treatment.

THE VALUE OF THE FOUR REACTIONS IN THE DIAGNOSIS AND TREATMENT OF SYPHILITIC DISEASE OF THE NERVOUS SYSTEM *

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The four tests which I shall discuss are Nonne's Phase 1 or ammonium sulphate reaction for determining an increase of globulin in the spinal fluid, the method for determining whether or not the lymphocytes are increased, and the Wassermann tests in the blood and in the spinal fluid. A fear has been expressed that by a multiplication of reactions the practice of medicine will eventually be reduced to a rule of three. Much[1] says of the Wassermann reaction that it controls the clinic and, on the other hand, is controlled by the clinic. This is true of all other reactions. Their significance must be construed in accordance with the clinical facts.

Nervous syphilis presents a great variety of symptoms, none of which can be said to be characteristic of it more than of some other disease, as multiple sclerosis or brain tumor.

The four tests are valuable as aids to a correct diagnosis for this reason.

NONNE'S PHASE I AND LYMPHOCYTOSIS

Nonne's Phase 1 consists in bringing equal parts of a hot saturated solution of ammonium sulphate which has been allowed to cool and spinal fluid together in a test-tube. If at the instant the two fluids come in contact or within a period of three minutes thereafter a cloudiness or opalescence appears in the tube, the reaction is recorded as positive; a cloudiness appearing after three minutes should be regarded as of no value whatever. The reaction may be read as slightly or strongly positive, depending both on its quickness of appearance and on the degree of opalescence.

The significance of Phase 1 when positive is regarded by Nonne as proof of an abnormal condition of the spinal fluid and consequently of the existence of an organic disease of the nervous system, which may or may not be of a specific character.

Phase 1 and lymphocytosis do not always occur together, and when they occur singly each has its own particular diagnostic value.

When occurring alone, Phase 1 simply speaks for an organic lesion of the nervous system. In all affections of the nervous system of specific origin this reaction is rarely absent. It may occur, however, in a large number of organic conditions which are non-specific in character.

In my own experience during the past year, in eight cases of general paresis Phase 1 was positive in all, as well as in five cases of cerebrospinal lues, three cases of tabes and two cases of tuberculous meningitis. In two cases of brain tumor of non-specific origin it was negative in one at the first puncture and positive in the next puncture after a further development of the disease; in the other case it was positive from the beginning.

In one case of multiple sclerosis, one case of old age apoplexy, and one case of tumor of the spinal cord, the reaction was likewise positive.

In nine cases of neurasthenia, eight cases of manic-depressive insanity, one case of dementia præcox and one case of pernicious anemia without cord symptoms, the reaction was negative.

In the eight cases of general paresis and two cases of tuberculous meningitis the positives were all strong. The strongest positive, however, was presented by the case of spinal tumor. In one of the cases of neurasthenia there was a history of a previous syphilitic infection dating back twenty years.

It will thus be seen that in all of the organic conditions of syphilitic origin Phase 1 was positive, and in the organic conditions of non-syphilitic origin there was only one negative, the brain tumor, which later became positive.

Lenhart says the normal number of lymphocytes in a cubic millimeter of spinal fluid is five or six, and that over nine is abnormal. Various methods have been utilized for the determination of the lymphocytes, but the one proposed by Fuchs and Rosenthal seems to be the most scientific. It consists in counting the lymphocytes in a special counting-chamber in the same manner as the white blood-corpuscles are counted.

Apfelt found lymphocytosis in 40 per cent. of his cases of syphilis in which the nervous system was unaffected, while Phase 1 was always negative. He regards Phase 1 as an important means of differential diagnosis in individuals with a specific history between beginning tabes and paresis on the one hand and cerebral neurasthenia on the other.

In all of my eight cases of general paralysis the increase in lymphocytes was marked, averaging fifteen or more to the cubic millimeter. In three of the five cases of cerebrospinal lues there was a lymphocytosis. In one case the number in 3 c.mm. was twenty-seven at one count and twenty-nine at another, so if one could

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* Read in the Section on Nervous and Mental Diseases of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

1. Much.: Die Immunitäts Wissenschaft.

not actually say a lymphocytosis existed, the number was certainly on the border-line. In one case of an apparently uncomplicated syphilitic endarteritis with hemiparesis the lymphocytes were normal.

In the two cases of tuberculous meningitis the number was increased. This was also true in the three cases of tabes.

In the two cases of brain tumor, one case of spinal cord tumor, one case of multiple sclerosis, one case of spastic paraplegia and one case of apoplexy the lymphocytes were normal in number. They were likewise normal in the nine cases of neurasthenia, eight cases of manic-depressive insanity, one case of dementia præcox and one case of pernicious anemia.

Of the two reactions considered singly, Phase 1 appears as the most important, because except in very rare instances its presence always means an organic lesion. The presence of the two reactions together indicates with the greatest probability syphilitic or metasyphilitic disease, excepting in cases of tuberculous meningitis in which the spinal fluid is also normal in color and appearance. On the other hand, the absence of the two reactions enables one with the greatest probability to exclude not only specific affections, but also any other lesion of the nervous system.

Nonne has expressed himself in regard to the two reactions and lesions of the nervous system of luetic origin in the following manner: In general paresis Phase 1 and lymphocytosis are positive in 95 per cent. of all cases, in tabes positive in 90 per cent. and in cerebrospinal lues rarely absent.

The question has been raised as to whether the character of the cellular elements themselves has a differentiating value in the various types of nervous diseases of syphilitic origin. On this point Andernach, after a careful study of the subject, says that unfortunately he has been unable to find any means of distinguishing tabes from general paresis or paresis from cerebrospinal lues by the character of the cells.

The tests furnished by the Wassermann reaction in the blood and in the spinal fluid have been of much value, not only in aiding in the diagnosis of specific disease, but also in differentiating between the various types of disease of luetic origin. This reaction in its application to diagnosis seems to have been greatly misunderstood. There has been a great diversity in the interpretation of its significance when positve and negative. The reaction is still regarded by many as specific, similar in character to the complement fixation which occurs when the serum of a typhoid patient is brought into contact with an extract of typhoid bacilli. This fact doubtless accounts for some of the misconceptions in regard to it. The reaction is not specific, but is chemical and mechanical in nature.

In order to arrive at a clearer understanding of a correct interpretation of the importance of the Wassermann reaction in diagnosis, one can state as a general proposition that the presence on the one hand of a positive result does not necessarily mean the existence of an active syphilis, nor does its absence on the other exclude an active syphilis. By keeping this general proposition in mind and endeavoring to find the reasons why it is true, the proper interpretation of our positives and negatives will become much easier.

Nonne says that the positive Wassermann in the blood does not necessarily signify the presence of an active syphilis, or that the symptoms presented are due to that disease. It means simply that the individual at some time during his life has had a syphilitic infection. The more the symptoms exhibited resemble those which syphilis is inclined to cause, the greater becomes the probability that these symptoms are of a luetic origin.

In applying the value of a negative Wassermann several important factors must be kept in mind.

We must remember that the number of antibodies in the blood-serum undoubtedly varies at different times and at different stages of syphilis. The number of antibodies present in the secondary stage is greater ordinarily than the number found in tertiary lesions and the number present in general paralysis greater than in cerebrospinal lues.

The antigen must also be regarded as an important factor, and according to the kind of antigen differs greatly as to sensitiveness. A complement fixation with an extremely sensitive antigen might be missed entirely with one less active.

We must also remember when not using the quantitative method that the antibodies present in the serum may be insufficient in number to make a complete complement fixation and consequently enough complement is left over to cause hemolysis.

The influence of previous treatment should always be taken into consideration. This is an especially important factor. Much says that the Wassermann in the primary and secondary stages frequently becomes negative by the administration of mercury and salvarsan and in the tertiary stage is quite easily influenced by potassium iodid. A positive reaction after a two weeks' treatment with potassium iodid is frequently rendered negative and may then remain negative for years. Much has also had the same experience with potassium iodid in tabes, although the symptoms were not influenced in the least. In one of my cases of general paresis an intravenous injection of salvarsan changed a positive reaction in the blood to a negative, which became positive again only after several months. In another case of the same disease the patient had been taking a mixed treatment for a number of months before he came under my care and although this patient has had no specific treatment for over two months, the Wassermann in the blood still remains negative. In both of these cases the reaction of the spinal fluid with 0.2 c.c. of fluid gave strongly positive reactions. In both of these cases the diagnosis was as clear as a clinical picture could make it. The symptoms of both cases were not influenced in any way and the globulin reaction and lymphocytosis were strongly positive. Before excluding general paresis from the diagnosis in a suspected case because the Wassermann reaction is negative in the blood, one should inquire carefully as to previous treatment.

In a case of specific endarteritis with hemiplegic symptoms previous to the time the four tests were made, the patient had been taking 25 drops of a saturated solution of potassium iodid for a period of two weeks. In this case the Wassermann reaction was negative in the blood and also in the spinal fluid when 1 c.c. of fluid was used. Uncomplicated specific endarteritis is, so far as I know, the only syphilitic lesion found in the central nervous system in which the Wassermann, when large quantities of spinal fluid are used, has been found to be negative. These negatives did not signify by any means either that lues could be excluded in the case or that the reaction was unreliable. It demonstrated simply the influence of treatment on the reaction. When we think of the large number of patients with tertiary and metasyphilitic conditions who either recently have been or are under treatment in some form at the time the Was-

sermann reaction is made, we must recognize the great importance of this factor in placing the proper construction on our negatives.

The spinal fluid seems particularly well adapted for the Wassermann. Unlike the blood, it contains no complement and consequently does not need to be inactivated. Also, unlike the blood, it does not become anticomplementary in large quantities and therefore makes quantitative examinations more simple. The complement-fixation ability, however, is much greater in the blood-serum than in the spinal fluid. Zeissler has estimated that 0.2 c.c. of the serum of a paretic is able to bind eleven units of complement while 0.2 c.c. of spinal fluid can bind only 3.8 units. Dr. A. Hauptmann, assistant in Dr. Nonne's clinic at Hamburg-Eppendorf, and Dr. Hössli, voluntary physician, observed that in most cases of cerebrospinal lues and tabes according to the original Wassermann, the reaction was negative when 0.2 c.c. of fluid was used. Therefore they came to the conclusion that the reason for this was in an insufficient number of antibodies present in the fluid to bind the amount of complement used. Of the two ways of proving this contention, either by increasing the quantity of the fluid or decreasing the complement, they chose the former.

They made a series of Wassermann tests, using the spinal fluid in quantities from 0.2 c.c. up to 1 c.c., and always doubling the quantity in the control tubes in order to be sure that the fluid itself did not produce a non-specific complement fixation. The results of these examinations demonstrated that in the majority of cases of cerebrospinal lues and tabes the Wassermann became positive only when a larger quantity of fluid was used than was contained in the original method, while in general paresis, on the other hand, the largest percentage of positives was obtained with the original quantity, 0.2 c.c. In not a single instance did they obtain a positive Wassermann in either a functional condition or an organic condition of non-syphilitic origin.

While my experience with this modified or quantitative Wassermann in the spinal fluid has not been large, it has proved extremely valuable in diagnosis.

In seven of the cases of paresis the Wassermann was positive in the blood and in the eight cases in the spinal fluid. The negative blood-reaction in the eighth case was undoubtedly due to the mixed treatment which the patient had taken.

In one of the five cases of cerebrospinal lues, the one which had been under the potassium iodid treatment, the globulin reaction (Phase 1) was the only one of the four tests which gave a positive result. In another, a case of relapsing hemiplegia of the endarteritic type in which the patient had received an intramuscular injection of salvarsan two months before, the Wassermann reaction was negative in the blood and in the spinal fluid, but the globulin and lymphocytosis tests were positive.

Two cases gave slight positives in the blood, and the spinal fluid did not become positive until 0.8 c.c. was used.

One case, in which there had apparently been no treatment of a specific nature whatever, gave a negative reaction in the blood and a positive in the spinal fluid with 1 c.c. of fluid.

In one of the cases in which the spinal fluid became positive with 0.8 c.c., the clinical symptoms resembled paresis. The primary lesion dated back ten years; the knee-jerks were absent; the bladder was involved, and on the psychic side there was loss of memory and intense depression. The differential diagnosis of pseudoparesis was made chiefly on the Wassermann reaction in the spinal fluid. The subsequent history of the case sustained the diagnosis.

The three cases of tabes gave moderate reactions in the blood and also in the spinal fluid when 0.6 c.c. was used. The nine cases of neurasthenia, eight cases of manic-depressive insanity, one case of spinal tumor, one case of pernicious anemia, two cases of brain tumor, one case of dementia præcox, one case of spastic paraplegia, two cases of tuberculous meningitis, one case of apoplexy and one case of multiple sclerosis gave negative reactions.

A study of the cases reported demonstrates not only the value of the four tests in the diagnosis of nervous disease but also the importance of making all of them in each case. If positive results from three of the tests are absent, the presence of a positive in one may lead us to a proper understanding of the absence of a positive in the others. If positive results are present in three or all four, they then become cumulative evidence.

In two cases of manic-depressive insanity, one with a positive history of a previous syphilis and the other with no history of a syphilitic infection, but with a family record of miscarriages and defective offspring, the negatives of the four tests gave me positive assurance in differentiating between a functional condition and a beginning paresis.

Nonne says that in general paresis the Wassermann is positive in the blood in almost 100 per cent. of the cases, positive in the spinal fluid in 75 per cent. of the cases with the original method, and in 100 per cent. of the cases with larger quantities of fluid. In tabes the Wassermann is positive in the blood in from 60 to 70 per cent. of the cases, and in the spinal fluid it is positive in from 5 to 10 per cent. with the original method, and in 100 per cent. with the modified method. In cerebrospinal lues the reaction in the blood is positive in from 80 to 90 per cent. of the cases; in the spinal fluid it is positive in about 10 per cent. with the original method, and always positive with the modified method.

A year's experience with these tests convinces me that when the results are negative there can be no stronger evidence for the exclusion of syphilis or syphilogenetic disease, and that when the tests are positive, no stronger evidence for the presence of these diseases.

ABSTRACT OF DISCUSSION

DR. M. NEUSTAEDTER, New York: As Dr. Ball stated, these reactions *per se* cannot be taken into account unless as a complement to clinical symptoms. For example, besides the diseases he mentions I find quite early in experimental poliomyelitis a positive globulin reaction and a lymphocytosis. In tuberculous meningitis I find the same thing and, unless the clinical symptoms appear early, it is impossible to differentiate by laboratory findings.

DR. W. B. CORNELL, Hathorne, Mass.: Is the differential count in poliomyelitis different from the differential count in the parasyphilitic diseases?

DR. M. NEUSTAEDTER, New York: It makes little difference whether the differential count is 90 or 89 per cent., because it varies even in poliomyelitis. The presence of a high number of lymphocytes together with a globulin reaction is really the criterion.

DR. A. L. SKOOG, Kansas City, Mo.: I have found cases of brain tumor and tuberculosis which were not syphilitic, although they gave decidedly positive Wassermann reactions both in the blood and cerebrospinal fluid. Therein is indicated the necessity of conjoint clinical examination. I had a case of glioma which was diagnosed as inoperable, and

the patient died in a few days. I did lumbar puncture and obtained a very positive Wassermann, and other findings were indicative of specific disease, yet on autopsy there was found a glioma involving the corpora quadrigemina and extending into the upper occipital lobe.

DR. A. C. BRUSH, Brooklyn: I had a case of undoubted tumor in which the Wassermann reaction was negative. The patient was put through a very vigorous course of antisyphilitic treatment and in a month he was walking around the wards of the hospital, previously having been a quadriplegic. It frequently happens that one cannot keep the patient free from the effects of iodid and mercury long enough to test the Wassermann reaction. In institutions in which we can keep patients for months, that is true, but when they come into the office and require immediate relief, as in the case of a tumor, one has to go ahead with the clinical symptoms and history, regardless of the findings of the Carnegie or some other laboratory.

DR. WILLIAM W. GRAVES, St. Louis: During the last three years I have done a great many lumbar punctures and have had many Wassermann tests made, both in the blood-serum and in the spinal fluid, and have almost invariably utilized the four reactions. I would not emphasize the value of any one of these reactions. Each is absolutely essential in diagnosis and differential diagnosis and we cannot use one without the others. Just as it is necessary in making an examination of the nervous system to consider it in its entirety, so in our studies of syphilis must we consider the whole individual and utilize every laboratory test which will throw light on the problem before us. Any single laboratory or clinical sign of syphilis may fail; hence the necessity for utilizing everything known in diagnosis. It is quite likely that the Wassermann reaction in itself is a variable one—present to-day, absent to-morrow—depending, perhaps, on the varying resistances of the individual. There are not a few cases in which clinical signs point unmistakably to a former syphilitic infection and in which the Wassermann is absent in the blood but is present in the spinal fluid even when 0.2 c.c. are employed; and there are cases in which it is positive only when greater quantities are utilized. But as far as the Wassermann reaction is concerned, it must not only be tested for in blood-serum and spinal fluid, but when spinal fluid is used variable quantities according to Hauptmann's method are absolutely essential. There is no single clinical sign which is always present; neither is there any laboratory test thus far known in medicine which is present in every case. Just as in our clinical examinations we try to utilize every point in diagnosis, so we must utilize each of the four reactions in any case of suspected syphilis.

DR. C. R. BALL, St. Paul: In obtaining spinal fluid, there is great danger of error from the presence of an exceedingly small amount of blood. I have found that when I have had any difficulty in getting into the spinal canal, so that perhaps I have a little blood in my needle, rather than let the first fluid that comes out run away, I had better postpone the puncture or take another needle, because the slightest presence of blood might give a globulin reaction where it really did not exist. A Wassermann reaction might be regarded very much as we look on a Widal. A man comes to us in perfect health and we make a Widal of his blood and find it positive. We know he has not typhoid fever at present, but do know that he has had it some time in the past because of the presence of this reaction. I wish to emphasize that in the uncomplicated cases of specific endarteritis we sometimes get a negative Wassermann with all quantities of fluid up to 1 c.c. That is important to remember, either with or without treatment. Whether the treatment had any influence on the reaction in the two cases which I have reported I do not know, but Hauptman calls special attention to this fact. We constantly see in the statistics on this subject, Wassermann positive in 100 per cent. of the cases of general paresis. Consequently, if we do not take into consideration the important factor of treatment, whether by potassium iodid, salvarsan or mercury, we are apt to err in our diagnosis, if we depend on a negative Wassermann for excluding general paresis. The Wassermann reaction in the spinal fluid is not so easily influenced by treatment as that in the blood, and in my two cases of general paresis in which the reaction in the blood was made negative by antispecific treatment, the spinal fluid in both seemed to be uninfluenced and remained uninfluenced over a period of months and is at the present time positive. I think for our diagnosis in nervous diseases we can depend more surely on the Wassermann in the spinal fluid than in the blood.

A CASE OF EXTENSIVE BRAIN DISEASE FROM ENDARTERITIS PROBABLY OF SYPHILITIC ORIGIN*

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The following case offers evidence of some interest in the occurrence of a diplopia explainable only on the functional activity of a small remaining portion of one visual field and of the retention of a very limited word-hearing capacity, in spite of the destruction of practically all of the left cortical auditory arrival-platform and the surrounding auditopsychic skirt. From the history there can be little doubt that the condition was luetic and yet the microscopic examination failed to reveal evidence of the specific nature.

History.—The patient, a man of 32 with a negative family history as far as could be ascertained, was born and raised in Brookline, Mass. His childhood was uneventful. He proved to be a student of average ability, but left school at the third grade of the high school. After one year as an errand boy in a large department store he went into the leather business and rose rapidly to the position of assistant manager. At the outbreak of the Spanish War he enlisted with the Naval Reserve and was assigned to duty on the U. S. S. *Prairie* and served throughout the war. He was a moderate though not constant drinker. In April, 1903, he had a sore on his penis followed by a bad sore throat lasting two months and a rash lasting two weeks, and was under treatment for syphilis for one year.

On discharge from the navy he was in poor physical health and showed some irritability. In July, 1904, one year and three months after the primary lesion, he experienced some difficulty in using his right leg. This was transitory and was diagnosed as a rheumatic disturbance. Two weeks later he had a "shock" while at his place of business, which was followed by some loss of power in both legs. At this time it was noted that his memory and judgment lacked their former accuracy. The shock did not give rise to unconsciousness, but left a diplopia which necessitated the closing of one eye to cut out the second image. Later he lost the use of his right arm for a short period. Early in September he had a general epileptiform convulsion and was sent to the Boston City Hospital where the diagnosis of cerebrospinal syphilis was made and where he remained six weeks under active iodid treatment. From the middle of October, 1904, to Jan. 1, 1905, he remained at home and during this time he had a general convulsion, which was very severe, lasting three hours, and which was followed by aphasia. He deteriorated rapidly during this time, was often confused and disoriented, and finally became aphasic and filthy.

Jan. 1, 1905, he was committed to the Boston State Hospital where he remained until transferred to this hospital, March 28, 1905.

Examination.—On admission he was quiet and showed a dementia-like reaction. He showed partial word-deafness, paraphasia and jargon aphasia, would not obey requests, was unable to name objects, exhibited paralexia, paragraphia and continually closed his left eye in attempting to read or

* Read in the Section on Nervous and Mental Diseases of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

* From the Laboratory of the Worcester State Hospital, Massachusetts.

observe objects. A note at this time suggests that a hemianopsia was already present. On physical examination on the day after admission, the patient was quiet with expressionless features; talked freely without slur or tremor of words, but was markedly paraphasic and appeared demented. Many of the tests of special senses could not be applied on account of failure of cooperation. Reaction to pin-prick was prompt and equal on the two sides. The knee-jerks were exaggerated, especially on the right. Babinski was present on right; no ankle-clonus. The pupils reacted very sluggishly to both light and accommodation. He was unable to walk without support. The hand-grasp was weak, especially on right. The left angle of mouth was a little depressed. The right nasolabial fold was obliterated. There was no wrinkling of forehead on right. Ophthalmoscopic examination quoted as showing a probable subsiding neuritis with commencing consecutive atrophy.

Course of Disease.—During his residence in the hospital (a period of six years and four months) he remained for the most part quiet, either in bed or in a chair, though occasionally he was noisy, and on a few occasions he apparently reacted to hallucinations. He was filthy at all times. He fed himself spontaneously and used the spoon correctly and when attempting to write used the pencil correctly with his right hand, showing no evidence of apraxia, though further tests of this could not be carried out owing to the dementia and lack of cooperation. His attention was easily held and at times he seemed to recognize the physicians and attendants. He was unable to give the alphabet and could not name the days of the week or count spontaneously. At times he was able to give his surname when asked and would recognize his given name when spoken to and generally would react to his name, and on one occasion produced a coherent sentence in response to the imitation of cats' mewing. He was unable to name pictures with one exception (dog) or geometrical figures and would obey only the simplest commands. Spontaneous drawing produced symbols of no likeness to the figure requested, while copied drawings were crude. One note records that when asked to read from print the word growler with the right eye closed it was read as clapper, with the left eye closed he spelled out the letters r-o-w-l.

Under emotion he would occasionally produce a coherent sentence, and an attempt to stimulate the Babinski reaction or a threatening movement toward the eyes from the sound side would often provoke a coherent and fairly fluent flow of profanity.

During the six years of his residence the records show a total of over 300 epileptiform convulsions. Many of them have been well recorded and included tonic spasms only, as well as tonic spasms of one or more extremity (not constant in origin), spreading to general tonic involvement followed by clonic spasm, frothing of the mouth, unconsciousness and involuntary evacuations.

Necropsy.—The autopsy was performed six hours after death.

In the trunk organs there was noted marked sclerosis of the coronary arteries, fibrous adhesions at the apex of the left lung, moderate excess of fluid in dependent portions of the lungs and slight mitral and aortic endocarditis. The microscopic examination added evidence of a slight bronchopneumonia, an early interstitial nephritis and a marked thickening of the vessel walls in the heart, spleen and kidneys.

On removing the calvarium the dura proved thickened, opaque and adherent. The pia was thin and fairly translucent, and contained a marked excess of clear serous fluid. The cerebrum weighed 1,055 gm., the cerebellum, medulla and pons 145 gm. In the right temporo-occipital region was a large cyst of softening filled with clear fluid (illustration, solid black). Externally the cyst was covered with pia while in those parts overlying the ventricles its floor consisted of ependyma only. It occupied all of the lateral surface of the temporal pole except the first temporal gyrus and all of the lateral surface of the occipital below a line of prolongation of the first temporal sulcus. On the mesial surface the anterior or recurved portion of the first temporal gyrus and the pyriform lobule were the only parts of the temporal area not involved. In the occipital field on the mesial surface the upper boundary of the cyst was formed by the common calcarine trunk and the calcarine sulcus proper, thus involving all of the visuosensory or visual arrival-platform cortex of this hemisphere, except the cuneus.

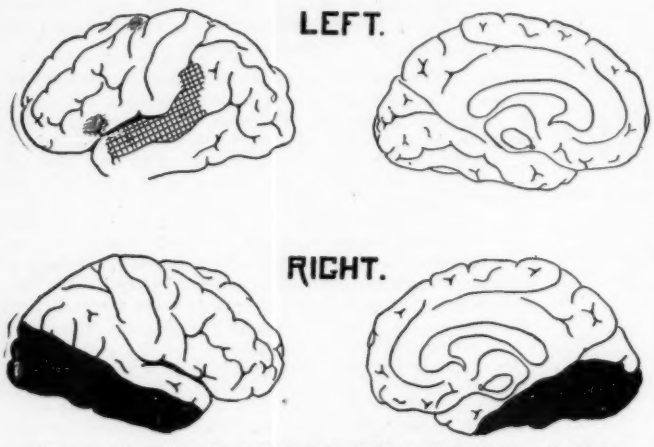

Diagram of the lateral aspect of each hemisphere. Solid black, cyst of softening; cross-hatching, cortical atrophy with glial replacement; light shading, pial thickening.

On the left hemisphere the first temporal gyrus was very much narrowed and of a softer consistence than the adjacent gyri (illustration, cross-hatched). This alteration was most marked in the midportion, but involved the gyrus from a point beneath the anterior sylvian trunk to the posterior end of the main sylvian fissure, including a portion of the supramarginal gyrus. There was a suggestion of regression below the general cortical level with some pial thickening in two areas of about 2 cm. in diameter, one over the foot of the third left frontal convolution (Broca's area) and the other at the foot of the first left frontal (illustration, light shading).

In the floor of the left lateral ventricle was a wedge-shaped area of softening 1.5 cm. in size lying in the head of the caudate nucleus and extending down into close relation with the anterior limb of the internal capsule.

The basilar artery showed areas of opacity and had a tendency toward irregularity of course though with no definite varicosity. The anterior and middle cerebrals and the left posterior cerebral were similar. The right posterior cerebral was very much thickened and its lumen, which stood open, was very small. Both the anterior and posterior temporal branches were very narrow at their points of origin from the posterior cerebral. The occipital branch in its course along the pial roof of the cyst bore several small opaque yellowish nodules.

The microscopic examination of the cortex from a variety of areas not involved in the gross lesions showed no evidence of alteration of any type, except a moderate thickening of the walls of the arterioles, a slight satellitosis and a slight marginal gliosis. The vascular thickening here was in the main unassociated with perivascular exudate though an occasional vessel could be found which showed a few lymphocytes. Sections from Broca's area showed apparently normal structure.

The atrophic first left temporal convolution was practically a glial cast of the original gyrus with no nerve cells or fibers in the cortex and only a portion of the fibers in the white

matter. These intact fibers of the white core were, I take it, the fibers of communication from other cortical areas whose cells were uninvolved.

The cyst of softening showed at its margin the usual close glia meshwork associated with long standing softened areas and a few adjacent vessels showed some perivascular exudate with pigmented phagocytes and a very few plasma cells.

Levaditi stains for the *Spirochæta pallida* in the large cerebral vessels proved negative.

Sections from the right posterior cerebral artery showed an interesting condition. The much contorted elastic lamina of the original vessel had apparently withstood the degenerative changes which had been at work and remained as a loose, ill-fitting jacket around a very small vessel built up within the lumen of the orginal. In other sections a marked thickening of the subintimal connective tissue had occurred giving rise to thick masses of fibrous tissue rich in fibroblasts, markedly narrowing the lumen but giving nowhere microscopic evidence of a specific process.

Unfortunately no Wassermann test was done at any stage of the process. The occurrence, however, of lesions of this type in a man of 32 with a definite history of a recent active syphilitic infection leaves little room for doubt that the process was a syphilitic endarteritis.

The similarity of the gross findings and that part of the microscopic picture pertaining to the involved areas to the organic dementias opens a question of how great the etiologic rôle of syphilis may be in this group. Certain it is that in this case in which syphilis may be fairly safely accepted as the cause, one could not attempt a diagnosis from the histologic picture; and it is entirely conceivable that many of the organic dementias which are similarly negative as regards microscopic evidence might likewise be luetic.

The reflex alterations and paresis of the right side are explained by the area of softening in the left lenticular nucleus and internal capsule, and the hemianopsia, on the basis of the loss of the greater part of the right calcarine cortex. The occurrence of diplopia, however, which necessitated the closing of the left eye, indicates the occurrence in consciousness of two unfused images. The cuneus was the only remaining part of the receptive cortical visual field on the right, and this must then have been the area of reception of the confusing image. The isolated observation recorded above suggests that the right eye, i. e., the left hemisphere, approached more nearly a true image of the object viewed than did the other. One is tempted to explain the occurrence of the confusing image by the comparatively intact group of association fibers leading from the cuneus to the adjacent posterior association field, i. e., parietal cortex, and the diplopia to interference with the interhemispheric association fibers crossing in the corpus callosum, many of which seem to have been lost.

The aphasic disturbance was of the sensory type and must be explained on the basis of the temporal lobe lesions. The method of serial total sections in these cases yields the only accurate localization of the lesions, but renders impossible careful histologic study of the nerve-cells, and in cases studied by this method one must discount the possible occurrence of wide-spread focal or stratigraphic cell losses in fields, which in the total sections are apparently normal, and yet which stand in close functional relation to the areas which have been destroyed. In choosing between these two methods one must take into consideration the clinical findings, and I feel inclined to reserve the total section procedure for those cases showing the least complication, while applying the histologic studies to those whose clinical expression has been complicated, or in which record is incomplete. In the present instance the concurrence of aphasia, hemianopsia, diplopia, alexia and agraphia, together with the difficulty of carrying out many tests because of the dementia, has seemed to warrant the use of the second method.

On the left hemisphere the temporal-lobe lesion occupied all of the cortex of the first temporal gyrus from a point below the anterior sylvian fissure around the end of the main sylvian and including a portion of the supramarginal gyrus. All the superior surface of the temporal lobe covered by cortex of the auditosensory type, i. e., transverse temporal gyri and adjacent cortex with the exception of a small portion of the second transverse temporal gyrus near its union with the convolutions of the insula, was also involved. Microscopically, this cortex belonged to the border-line between auditosensory and insular types.

This lesion had not resulted in complete softening but in an atrophy of the cortex with glial replacement. The white core of the gyri still contained a considerable number of fibers which took the stain well, while the losses in the more deeply lying white matter were apparently small in amount.

The lesion of the right temporal lobe was practically complementary to that on the left, i. e., it had obliterated all of the temporal lobe except the superior and transverse gyri.

The patient recognized his given name when addressed and at times would carry out very simple commands, so that if we accept the cortex of the transverse temporal gyri as the arrival-platform for auditory impulses we must either grant a functional capacity to the small practically isolated island of cortex of mixed auditosensory and insular type, or accept a very limited word-hearing capacity reaching the cortical centers of the left hemisphere by way of the right auditory arrival-platform and commissural tracts.

The dementia was of comparatively sudden development and not of the gradually advancing type usually following loss of the word-hearing capacity. This disturbance is better explained perhaps on the tremendous loss in the right hemisphere than on the smaller and probably more slowly progressive lesion of the left temporal lobe. Spitzka has put forward the suggestion that the right hemisphere is the predominant sensory hemisphere as the left is the predominant motor. The left hemisphere in right-handed persons has been accorded the centers for origination of motor-speech impulses and such localization seems to be definitely proved, but this in no way reacts against the possibility that the right temporal field may be an important storehouse of the auditory memories, which probably form in most persons the basis for internal speech.

The Mental Factor in Functional Diseases.—The general practitioner should have in mind the mental factor in the many forms of symptom-complexes under his care. He should further bear in mind that at least 75 per cent. of the patients that come to him for treatment are psychopathic in character, psychosomatics or psychoneurotics in one form or another. The general practitioner should learn to diagnose the psychic origin of many a symptom-complex apparently physical in its manifestations. Not only will the patient benefit by a medical scientific treatment, but there will be less occasion for the many mystical, occult cults, Christian Science, New Thought, as well as prize-fighter treatments, absurd food cures, quasi-scientific and pseudohygienic doctors and mental healers who, like poisonous weeds, have overrun our country from ocean to ocean and threaten to undermine the health and to deteriorate the intelligence of the nation.—Sidis in *Archives of Diagnosi-*

CARDIOSPASM WITH SACCULATION OF THE ESOPHAGUS, WITH SPECIAL REFERENCE TO THE PERSISTENCE OF THE SAC*

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Since reporting, two years ago,[1] a series of ten cases of cardiospasm with sacculation of the esophagus, we have had the opportunity of studying four additional cases and of observing the after-results in eight of the fourteen cases treated. The clinical and *x*-ray observations of the results in these cases have ranged over periods of from one to four years after the cessation of treatment. It is to these observations especially that we wish to call attention here.

When our original paper on this subject was presented, insufficient time had elapsed following the treatment of the cases to justify any absolute statements as to the ultimate results, but based on the pathologic findings we ventured the statement that while a fairly complete symptomatic cure was possible, an anatomic cure seemed most improbable in those cases in which sacculation existed to any marked degree. We believed that even after complete stretching and paralyzing of the cardia, it was questionable whether any of these patients in whom sacculation existed would be found entirely free from symptoms; that they would always have to exert more or less care in the amount and character of food taken, and the manner of ingesting it; furthermore, that the more marked the distention of the esophagus the less complete would be the cure and the more pronounced the after-symptoms. Since that time we have been able to observe three of our patients for periods of four years or more, and five for periods ranging from one to three years, and have been able to verify in them the belief expressed at that time.

We may accept as a fair example of these patients those who received treatment four years ago and who to all intents and purposes are well, are experiencing little or no difficulty in swallowing, and yet are made to realize that they are not normal individuals. Without exception they state that their condition is so much better than prior to the treatment that they pay little or no attention to the existing minor ailments, yet they must exert care in eating and must not eat rapidly or swallow their food in large masses, some finding it best to avoid very cold fluid and solid articles of diet. Some of these patients have observed that the foods which are light enough to float on water cause more difficulty than those which are heavier, a fact which is to be readily accounted for through our observation that fluid secretions collect in the sac as the result of the negative pressure which exists there, and that very light articles of food are kept afloat within the sac. In spite of the brilliant results obtained through the forcible divulsion of the cardia through hydrostatic pressure, we have been unable to find a single case of advanced cardiospasm with sacculation in which these mild symptoms did not exist, and we believe that others who may later report the after-results in their cases will have met with practically the same experience.

* Read in the Section on Practice of Medicine of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

1. Myer, J. S.: Cardiospasm with Dilatation of the Esophagus, THE JOURNAL A. M. A., Oct. 29, 1910, p. 1544.

PERSISTENCE OF THE SAC AFTER CURE OF CARDIOSPASM

The reason for the persistence of the symptoms has been clearly shown by us to be due to the persistence of the sacculation, which seems to undergo but little shrinkage after the spasm has been overcome, and to the consequent loss of the normal peristalsis of the lower third or two-thirds of the esophagus.

In our attempts to demonstrate the persistence of the sac in all of the cases that we were able to keep under observation, we resorted first to the introduction into the esophagus of a stomach-tube with an intragastric, thin rubber bag attached, somewhat similar to that which has been described by others. Into this the water was gradually injected by means of a large glass-metal syringe until the patient experienced great discomfort as a result of the distention. It was found invariably that almost as much fluid could be injected into the sac four years following the "cure" as could be introduced just prior to the commencement of the treatment. In other words, we could introduce into the sacculation that persisted as long as four years after the treatment, from 200 to 400 c.c. of fluid. This led to the observation of these cases before the fluoroscopic screen, using bismuth suspension in soured milk.

Figure 1 shows the radiograph of Patient 4 of our original series taken with over 300 c.c. of bismuth suspension injected into the bag. This patient subjectively and objectively seems perfectly well, and carries on his work as bank clerk with practically no discomfort. His weight is now 168 pounds as compared with 138 pounds prior to his treatment four years ago. He experiences no obstruction whatever, but has learned by experience that he is most comfortable if he eats slowly and avoids coarse foods and cold drinks. He finds, too, that a small quantity of fluid secretion collects in the sac, and he is made aware of its presence through its regurgitating into his mouth and nose during the night. To avoid this he empties the sac at night by bending forward with his head low and forces this fluid out through an expulsive movement. The expelled fluid never contains food particles, but is composed of a frothy, mucoid solution, evidently largely saliva.

Figure 2 is the radiograph of Patient 5 of our original series. This patient though well, manifests similar minor symptoms, but the sac easily contains 350 c.c. of bismuth suspension. These are fair examples of the *x*-ray observations made in all the cases we have been able to follow. The persistence of the sac was demonstrable in every case, the only variation being in the size of the sac.

In order to determine to what extent the normal esophagus can be stretched, a series of normal persons were observed in a similar manner, and in no case were we able to inject into the intragastric bag within the esophagus more than 40 to 60 c.c. of fluid without causing the patient the most intense discomfort. Figure 3 represents the radiograph of the normal esophagus stretched to the utmost.

The technic of this work is perfectly simple, the tube with intragastric bag being readily introduced either with or without a mandrin. The fluid is then injected by means of a large glass-metal syringe.

If these patients be placed before the screen and be given bismuth-pap mixture, it is seen to drop rapidly to the cardia, where it halts for a second and then enters the stomach. In other words there is no food retention in the sac as is the case prior to treatment.

In spite of the recent excellent literature on the subject of cardiospasm, it is evident that the condition

is not being recognized by the majority of practitioners, and especially not until far advanced and irreparable damage, such as that described above, has been done. It will not be amiss, therefore, to call attention again to the symptom-complex of this interesting phenomenon, and to review briefly the means of diagnosis.

Believing firmly that the spasm is the primary manifestation and sacculation secondary to it, we are convinced from these studies that the earlier the condition is recognized, the more complete will be the cure, and the longer the condition remains untreated, the more incomplete both the clinical and the anatomic cure.

SYMPTOMS OF CARDIOSPASM

In some of the cases which came under our observation gastric symptoms had existed for a considerable period before definite symptoms of spasm were evident; in several of the cases the onset was sudden and unaccompanied by previous gastric symptoms. The earlier manifestations, in the cases of gradual onset, had almost invariably been treated as milder forms of indigestion, usually as nervous dyspepsia, being characterized by a "lump in the stomach," a feeling of fulness after eating, burning sensations in the epigastrium, and in some cases pains radiating from the epigastrium toward the hypochondriac regions. We have been impressed with the frequency with which patients have complained of pains radiating from the region of the cardia apparently along the diaphragm toward both sides and more especially the right side. The complaint of a "lump in the stomach" and a feeling of great discomfort at the moment the food enters the stomach is a common one. Within a comparatively short period these patients begin to experience difficulty in the process of deglutition, and are treated for hysteria. We feel that if the stomach-tube were used more systematically as a diagnostic measure in all cases of indigestion, more cases of early cardiospasm would be discovered through the obstruction offered to the passage of the tube. At this stage the patient begins to complain that food "lodges under the end of the sternum," and endeavors to force it through by swallowing air, or following each mouthful with a sup of water. Each act of deglutition is now accompanied by more or less obstruction as the food passes the cardia, and then soon follows the stage of definite obstruction, when the patient finds it impossible to swallow coarse articles of food, such as meat, bread, etc. He voluntarily resorts to soft or liquid foods, such as eggs, purees, cereals and the like. As the obstruction becomes more complete many of the soft foods are also discarded, and only liquids taken.

Up to this time the wall of the esophagus has been undergoing hypertrophy in its effort to overcome, through increased peristalsis, the obstruction at the cardia, and there now occurs, as is usual in obstructed, hollow viscera, a dilatation or sacculation. After sacculation occurs, the patient is somewhat relieved of the actual pain that he has been experiencing. Up to this time he may have been spitting up mouthfuls of food from time to time, but now begins to eructate large quantities. This process must be differentiated from actual vomiting, for these patients find it practically impossible to vomit, since the cardia will not relax sufficiently to permit the return of the food that has entered the stomach. At this stage the patient is often compelled to get up from the table and empty the esophagus, and then return and eat more. As the sac increases in size, he may even retain an entire meal before eructating any of the food, all the while, however, experiencing a feeling of great discomfort and pressure

Fig. 1.—Radiograph showing the persistence of the sac four years after the successful treatment for cardiospasm. Capacity over 300 c.c. of bismuth suspension. Recumbent, oblique position. Intensifying screen.

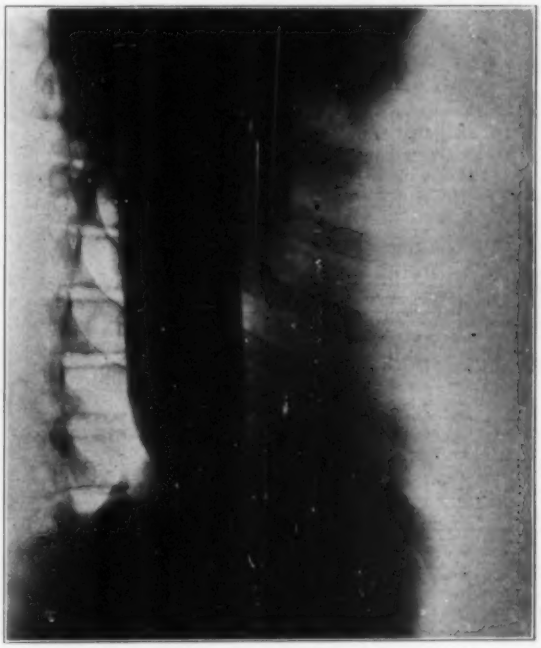

Fig. 2.—Radiograph showing persistence of the sac several years after successful treatment of cardiospasm. Capacity over 350 c.c. of bismuth suspension. Recumbent, oblique position. Intensifying screen.

under the sternum. He learns to eat slowly, chew his food thoroughly, and to stop after each act of deglutition to "tease the food through." Coarse and ice-cold foods are the most difficult of deglutition, warm soft foods and liquids being the easiest to dispose of. The patient is often surprised to find that at one time he is able to swallow with considerable ease, because of a temporary relaxation of the spasm, and that within a few moments he is unable to force anything through. A small quantity of solid contents and fluid secretions can practically always be found in the sac, and at night will in certain positions of the patient, flow from the mouth during sleep, soiling the pillow, sometimes flowing into the nose and occasionally into the trachea, causing fits of coughing and strangulation. One patient, for instance, found that when he turned to his left side the contents of the sac always gravitated into his mouth.

Fig. 3.—Radiograph showing degree to which the normal esophagus can be stretched by means of a thin rubber bag. Capacity 40 to 60 c.c. of bismuth suspension. Recumbent, oblique position. Intensifying screen.

Fig. 4.—Radiograph in a case of untreated cardiospasm showing the act of swallowing a bismuth mixture; the enormous size of the esophagus and its efforts at peristalsis may be noted. Recumbent, oblique position. Intensifying screen.

With such a clinical picture as this, the diagnosis of cardiospasm should at once be suspected, even without further examination, but instrumentation and chemical analysis of the contents should always be resorted to in order to make an absolute diagnosis.

METHODS OF DIAGNOSIS

On the introduction of bougies or stomach-tubes an obstruction is met about 40 to 45 c.m. from the teeth which is sometimes readily overcome, but at others very resistent. The soft tube may be more or less misleading in determining the existence of an obstruction, unless a mandarin is used, for the tube, instead of passing the cardia, may double up in a large sac in such a way as to give the impression that it has entered the stomach. The blunt, paraffin-silk bougies are preferable for determining the existence, location and degree of obstruction. It must be borne in mind, however, that during a moment of temporary relaxation even a large bougie may pass readily.

In order to determine the presence and the size of the sacculation, a stomach-tube with intragastric bag attached, as described before, should be employed. This is introduced to the point of obstruction and water gradually injected until the patient complains of considerable discomfort, when the water may be withdrawn and measured, and a fair idea of the degree of sacculation obtained.

One of the most important diagnostic measures is the chemical analysis of the contents of the esophagus as compared with that obtained from the stomach. In order to obtain the stomach contents and esophageal contents separately, we have found it well to introduce a small stomach-tube or nasal tube containing a mandrin directly into the stomach, removing the mandrin and obtaining the stomach contents, then withdrawing the end of the tube into the esophagus, and through siphonage or suction obtaining the contents of the sac itself. The character of the gastric and esophageal contents is different; those from the stomach are well chymified and finely divided, with the typical odor, contain free hydrochloric acid but as a rule no lactic acid, show traces of sugar, have normal peptogenic power and contain yeast cells, etc.; whereas the esophageal contents are coarse, flocculent and poorly chymified, contain much mucus and salivary admixture, are practically odorless, are slightly acid in reaction, containing lactic acid but no hydrochloric acid and have no peptogenic power; sugar is present in considerable quantity because, as we have stated previously, there is present here every factor necessary for carbohydrate digestion and sugar production. For demonstration

purposes one may introduce fluids of different colors, for instance, carmin and methylene-blue, one into the stomach and the other into the esophageal sac, and afterward may obtain these fluids separately.

Both fluoroscopy and radiography are great aids in the diagnosis. If the patient in the oblique position before a screen be given a bismuth suspension or pap, it is seen gradually to collect just above the diaphragm and form a large shadow depending on the size of the sac. A small quantity may be seen to trickle gradually through the cardia into the stomach. It is especially interesting in these cases to employ the intragastric bag partially filled with bismuth suspension and observe it in relation to the heart-beat, respiratory movements, the process of deglutition, the act of vomiting, etc. The sac lies practically in direct contact with the heart, and when distended shows the indentation of the right auricle and ventricle, each pulsation causing a wave on

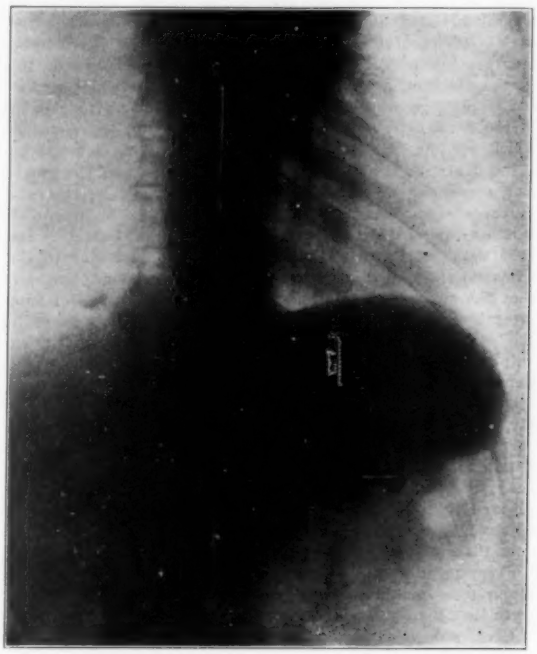

Fig. 5.—Radiograph of a case of untreated cardiospasm, by means of a large, thin, rubber bag, part of which is in the stomach and part in the esophagus, showing the point of constriction at the cardia. (The bag ruptured in the stomach at the moment the exposure was made.)

the surface of the bismuth suspension. It is surprising that there are not more marked cardiac symptoms manifested as a result of the direct pressure of a large quantity of contents in this sac, especially when we take into consideration the cardiac symptoms that may be produced as a result of slight pressure from beneath the diaphragm.

It is a fact, however, that these patients experience little or no cardiac disturbance. This is to be accounted for, it seems, through the accommodation of the heart to the gradual development of the sac. So far as our observations go, the heart is not perceptibly displaced through the filling of the sac. Radiographs taken immediately after a bread and bismuth meal show the sacculation nicely, but not so satisfactorily as when the intragastric bag is used.

The chief value of the esophagoscope in these cases lies in the differential diagnosis between cardiospasm, carcinoma and stricture of the esophagus, due to scars, the result of chemical or mechanical insults. In doubtful cases one may take sections by means of the biting forceps for microscopic examination. In our experience, however, this is seldom necessary, for a careful history together with a demonstration of an enormous sacculation of the esophagus is usually sufficient for diagnosis. Advanced carcinoma could not easily be mistaken for cardiospasm, nor could advanced cardiospasm be readily mistaken for carcinoma. It is only in the early manifestations of both conditions that one may be left greatly in doubt. Carcinoma of the esophagus seldom results in such dilatation as is found in cardiospasm. If there is any doubt, however, as to the existing condition, the esophagoscope only can clear up the diagnosis promptly and definitely. The interior of the esophagus, as seen through the esophagoscope, is quite different from the normal; the walls are flaccid, and the mucosa is thrown into small rugæ or convolutions and is edematous in appearance, presenting a state of esophagitis. At the cardia occasionally may be seen small erosions or ulcers. The cardia itself presents a rather smooth, regular, whitish appearance in contradistinction to the reddish, granular, cauliflower appearance of the carcinoma, the angry, injected appearance of the ulcer or the white, glistening, irregular outlines of scar tissue.

It is not our intention to enter into any details here concerning the technic of treatment more than to repeat that divulsion by means of a silk-rubber bag from 3 to 3.5 cm. in diameter by hydrostatic pressure gives most satisfactory results. Either the water-pressure with manometer attached may be used, or the large, glass-metal syringe, which in our hands has given quite as satisfactory results.

The etiology is still a dark chapter, and we are not prepared to present any more definite information on this point than that contained in our original article.

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ABSTRACT OF DISCUSSION

DR. H. S. PLUMMER, Rochester, Minn.: In looking through the literature one finds a tendency to associate diffuse dilatation of the esophagus with a congenital or acquired neurosis. Among the ninety-one patients coming under my observation with diffuse dilatation of the esophagus without anatomic stenosis there were only a few of a neurotic type. Mild cardiospasm without diffuse dilatation of the esophagus occurs, as a rule, in neurotic persons. Cardiospasm may accompany such gross gastric lesions as syphilis, ulcer, carcinoma, etc.; diffuse dilatation of the esophagus does not often follow the spasm in the latter group of cases. There are many reasons why these conditions have been so frequently overlooked. A stomach-tube or sound may pass the cardia without encountering any resistance at a time when neither liquids nor solids will pass the cardia. Frequently the tube coils in the sac and the contents are withdrawn without the operator having any suspicion that the tube has not entered the stomach. In some instances the history is much like that of a gastric neurosis. With a few exceptions the seventy-three cases which I have reported as cures are absolutely free of any evidence of dysphagia. I have not as yet been able to determine the ultimate fate of the dilatation of the esophagus. In three patients whom I examined approximately three years after the last dilatation, the esophagus had returned to normal size and as far as I could determine to normal function.

DR. G. W. MCCASKEY, Fort Wayne, Ind.: I wish to discuss cardiospasm in its relation to malignant disease. I have had under observation about fifteen cases of cancer of the cardia.

In six or seven of these there occurred prolonged attacks of cardiospasm. In some of these the complete closure of the cardia which occurs with the advancing growths of the neoplasm was undoubtedly partly spastic in character, as it fluctuated materially and would permit the passage of food or instruments at one time and not at another. Temporary improvement in deglutition has followed mild instrumental dilatation in some cases. This is best explained on the assumption of spasm relieved by divulsion. Of course this improvement is only transient, and too slight to be entitled to any serious consideration excepting in its bearing on the pathology of cardiospasm, and the question of differential diagnosis in the earlier stages. In cases of cardiospasm of recent evolution, the possibility of the existence of cancer of the cardia as the etiologic factor should be considered, and every means utilized to make an accurate differential or complete diagnosis.

DR. J. W. WEINSTEIN, New York: I fully agree with Dr. Myer that cardiospasm is not often recognized, and masquerades under a variety of names, chiefly neuroses, because the stomach-tube is not used often enough. I must say, however, that the diagnosis is often difficult even if the aid of the stomach-tube is invoked. The main difficulty is the differential diagnosis of cardiospasm and carcinoma of the cardia. Of course, in the typical cases the diagnosis is easy. Thus I have now on hand a patient who has complained of dysphagia for the past four years. His general appearance is not bad. On passing a bougie I find that it meets with an obstruction at the cardia. By using a little force I make the bougie pass through into the stomach. The *x*-ray examination shows a slight pouch above the cardia. A case of this order means nothing else than cardiospasm. On the other hand, if a patient of cancerous age comes with a history of short duration, with loss of flesh and strength; if the introduction of a bougie invariably meets with obstruction at the cardia and causes bleeding, and if a fetid odor emanates from the tip of the stomach-tube or bougie, a case of this kind is a carcinoma of the cardia. A large number of cases, however, do not come under those headings at all. Thus a patient was referred to me recently by his physician for diagnosis with a history of dysphagia for the past eight months. The *x*-ray showed a stenosis of the cardia with a small pouch above it. The general condition was good and the diagnosis of cardiospasm was made. The patient kept on improving in all respects for about six weeks, when he suddenly developed a metastatic tumor in the cecum. Dilatation of the esophagus above the seat of obstruction is by no means characteristic of cardiospasm. I have seen that repeatedly in carcinoma of the cardia. Even the gastroscope is not proof against error, for it happens from time to time that the carcinoma of the cardia will be covered over by normal mucous membrane, and the gastroscope will reveal in such cases a normal appearance of the esophagus concealing the cancer underneath from view.

DR. FRANKLIN W. WHITE, Boston: I wish to emphasize two points that have been mentioned: First, while, according to statistics, cardiospasm is comparatively a rare disease, much less common than cancer of the esophagus, I do not believe this. I feel sure that many cases that have been diagnosed as simply nervous dyspepsia are really cases of early cardiospasm before the sacculation has developed. Remember that the chief symptom of cardiospasm is distress immediately after eating. Second, the spasm is intermittent. It contracts and relaxes. At one moment we may get a normal *x*-ray picture of the esophagus and a few minutes later during spasm, a clear picture of a filled and dilated esophagus. Recently I have had several such experiences.

DR. ANTHONY BASSLER, New York: There seems to be a subconscious understanding that cases of cardiospasm are due to closures of the cardiac orifice of the stomach because of a constriction of the circular fibers surrounding it. *X*-ray plates of cardiospasm suggest that the area of spasm is at the level of the diaphragm within its esophageal opening. The esophagus extends about an inch and a half below this before it reaches the cardiac orifice. Careful fluoroscopic observation in these cases shows that a spasm is never located in this abdominal portion of the esophagus which runs in back of the liver or at its opening in the stomach. According to a series of observations that I have made, there is reason for the belief that cardiospasm is not due to spasm of the circular fibers of the esophagus but to spasm of the esophageal opening of the diaphragm. I shall report my observations when I have a large enough series of cases. Further, cardiospasm, like pylorospasm, may occur reflexly. We know that gallstones, gastric or duodenal ulcer and chronic appendicitis are commonly found as exciting causes in pylorospasm; so in cardiospasm, pathologic processes above or below the dome of the diaphragm may cause this spasm in not a few of those which have been looked on as neurotic cases. I have done post-mortems in a few cases in which cardiospasm was a feature during life. In practically all of them, lesions of a chronic nature were found in the chest, if not in the abdomen. Among the causes which must be added as productive of cardiospasm are firm adhesions of the pleura, mostly of a tuberculous nature, particularly those present at the bases of the lungs. Normally the lower end of the esophagus is funnel-shaped, or at ast has parallel walls. The opening is not completely closed as a rule even during normal digestion. It is probable that during the process of gastric digestion, the cardiac orifice of the stomach prevents regurgitation of food into the lower end of the esophagus, not by closure of the esophageal opening of the diaphragm or the circular fibers at tne esophagogastric junction, but by the peculiar arrangement of the rugæ extending from the esophagus into the stomach, which act like flaps of a valve when pressed on from below.

DR. JESSE S. MYER, St. Louis: I should say to Dr. Plummer, concerning the cause of the obstruction met by the tube in these cases that it is not always possible to determine whether this obstruction is offered through the contact of the tube with the walls of the sac, or whether it is due to the spasm at the cardia. There is no doubt in my mind, however, that the obstruction is often the result of the spasm. I have often been able to demonstrate this by introducing a sound to the point of obstruction, when without any manipulation it will often suddenly slip through. I do not want to convey the impression, however, that there is constantly present a tonic spasm in these cases. With regard to the persistence of the sac, and the persistence of minor symptoms, it is unfortunate that Dr. Plummer has not been able to follow more of these patients after successful stretching of the cardia. Of course the reason for this is that they have been so decidedly relieved that there was no occasion for returning for further treatment; but from my own observation, I feel reasonably sure that it would be possible to demonstrate that in all of the severe cases the sac has persisted for years after the major symptoms have been relieved. I agree with Dr. Weinstein that the diagnosis is sometimes difficult to make; nevertheless, one would seldom take a case of advanced cardiospasm for carcinoma, or an advanced case of carcinoma for cardiospasm. It is in the early manifestations of these two conditions that one is most likely to be misled. A case which I had under observation for over two years, and which I had considered one of cardiospasm, proved to be a slowly developing scirrhous growth involving the cardia and a portion of the fundus. One seldom sees so marked a dilatation of the esophagus in carcinoma at the cardia as is observed in this case.

Feeding Children After Anesthesia.—A breast-fed infant can be put to the breast two hours after coming out of the anesthetic. He should be nursed for only half the usual time; if all goes well, next time he may be nursed his full nursing period. A bottle-fed infant can be fed two hours after coming out of the anesthetic with his regular bottle-feeding diluted one-half with water; if all goes well, his next bottle-feeding should consist of his usual food. A child can be given something to eat not sooner than two hours after coming out of the anesthetic. This food consists of hot broth; in throat cases the first food should consist of cold broth.—Kilmer in *Archives of Pediatrics.*

BLOODLESS SURGERY OF THE LIVER

AN EXPERIMENTAL STUDY OF THE POSSIBILITY OF EXCISION OF MAXIMUM AMOUNTS OF LIVER TISSUE, WITH THE USUAL INSTRUMENTS AT HAND IN ANY HOSPITAL*

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MILWAUKEE, WIS.

The object of this research is to contribute something to the development of practical methods of dealing with the most severe injuries of, and with the wounds resulting from, extensive operations on the liver, employing only the means at hand in the usual surgical armamentarium.

Although hundreds of operations, since Lin's successful partial resection in 1886 on the liver, have been reported with a steadily decreasing mortality it can still be said that surgery of the liver is an imperfectly developed field. From the beginning liver surgery has been feared and shunned on account of hemorrhage, and to-day, notwithstanding the numerous and ingenious methods of hemostasis devised, the only remaining obstacle to the general application of surgery of the liver carried to its physiologic limit is hemorrhage. The many hemostatic methods invented and the combinations of them were born of a necessity of treating special lesions in different parts of the liver. Consequently few if any procedures or combinations of them are applicable to all lesions.

THE PHYSIOLOGIC LIMIT TO RESECTION OF LIVER TISSUE AND THE EFFECT OF TEMPORARY ARREST OF CIRCULATION IN THE ORGAN

Glück in 1890 found that one-third of the liver could be sacrificed without detriment, and in 1889, 1890, 1895, Ponfick's experiments showed that about 40 per cent. of his animals could live after seven-eighths of the organ was removed. Ponfick was the first to recognize the marvelous vegetative power of the liver. After removing three-fourths of it he observed that it would regenerate to four-fifths of its normal weight, and in some cases to its full weight, in a few months; also that the secretion of bile was not affected to any noticeable extent. Among the 100 unreported liver abscess cases in my Philippine service, the following illustrates this power of regeneration in man:

R. P. H., aged 24, cook, light battery D, Sixth U. S. Artillery, was operated on in Manila for a large solitary abscess of the liver in September, 1900. Until the end of November the amount of mucopus, full of motile amebas, which was discharged daily was almost incredible; the very voluminous dressings became saturated every eight hours; the discharge would overflow into the bed and at times soak through the mattress and drip onto the floor. Through the large anterior opening a sound 26 cm. (10 inches) long could be waved about in the cavity in all directions, showing that there was but a mere shell of liver tissue left. The temperature from the beginning ranged irregularly from just above normal to between 102 and 103 F., until the end of November, when it occurred to Surgeon Douglas Duval, U. S. A., to suggest the use of a 1:1,000 quinin solution to irrigate the cavity. The patient had become waxy in appearance, and was quite helpless from debility, but improved immediately after the quinin irrigations were begun, and was able in one month to go on the hospital ship on a voyage of recuperation, from which he returned in two months apparently well, with a regenerated liver, and returned to duty a few weeks later. The army records show that this man was finally honorably discharged Dec. 23, 1901, in good health.

J. Hogarth Pringle[1] reported in 1908 that he employed digital compression of the portal vein at the foramen of Winslow, which completely arrested all bleeding from an extensive laceration of the liver, and in pursuing the subject was surprised to find that Ponfick and others had had disastrous results from obstructing the hepatic and portal vessels in their experimental animals, and that Langenbuch stated that the death of the animal occurred almost at once, from collapse in some, or within a few hours in others, apparently owing to stagnation of blood in the portal area. Pringle, employing rabbits anesthetized with chloroform, as Ponfick had done, clamped the portal vessels with narrow pressure forceps, the blades of which were covered with rubber tubing, for from one hour in one case to long enough in three others to permit amputation of a lobe. The circulation was completely controlled, and the only change that occurred in the intestines by the end of the hour was that in color they were possibly a little darker than when the abdomen was first opened. All of the four animals recovered and developed no untoward symptoms; they were killed on the fourth day and nothing abnormal was found. After his experiments Pringle had two clinical cases with liver rupture and controlled the circulation by digital pressure during the operations. Ponfick proposed and Langenbuch seconded a plan of avoiding dangerous congestion of the intestines following temporary obstruction to the portal circulation, of preliminary temporary ligature to the superior and inferior mesenteric arteries. This procedure is surely impractical in all severe traumatic cases, and experience so far does not show the necessity for it in other cases.

In some experimental work on animals, the first three dogs, under ether anesthesia, recovered from an arrest, lasting from twenty to thirty minutes, of all circulation in the liver; they were killed ten days later and the postmortem examinations showed no lesions; a few other dogs died at once or within a few hours, but no particulars were given, except that the operative conditions were very unsatisfactory.

During the application of the clamp, the intestines of the first three dogs within a few minutes became slightly bluish in color, which color deepened with increasing portal congestion until at the end of twenty and thirty minutes the color was dark and small subperitoneal extravasations of blood appeared especially on the stomach; the liver became markedly softer and paler in color. On the removal of the clamp the liver rapidly regained its normal color and consistency, and the congestion of the gastro-intestinal canal subsided. Many carefully observed experiments under ether should be made along this line before we can lay down any rules or be at all sure of our premises in employing this radical procedure.

THE PRESENT METHODS OF HEMOSTASIS

Hemostatic procedures to meet special conditions are too well known to need more than mention and consist of the cautery and steam, which are unsatisfactory; mass ligatures; vessel ligation; rubber gauze and silk ligatures as constrictors; suturing of the liver to the abdominal walls and into the abdominal wound; omen-

* Read by invitation at the 1912 Annual Meeting of the American Surgical Association, at Montreal, Canada.

1. Pringle, J. Hogarth: Traumatic Hepatic Hemorrhage, Ann. Surg., 1908, xlviii, 541.

tum plastic; compression clamps; tampon, and the combined cautery, tampon and suture.

Kousnetzoff and Penski, in 1894, introduced a decided improvement on former methods, which consists in passing a double thread on blunt needles back and forth through the liver some distance above the line of resection leaving the suture slack between the points of insertion. These threads are cut and the ends tied producing gentle pressure, controlling hemorrhage. The larger vessels in the cut surfaces are then ligated or circumstitched; for wounds of excisions of a portion of a surface, Kousnetzoff and Penski recommended a continuous suture with a gauze packing below.

Ceccherelli and Bianchi introduced their whalebone strips and later decalcified bone plates on the upper and lower surfaces of the liver, and then sutured through them, compressing the wound margins, leaving the suture ends long and ligating them over the cut surfaces. Carl Beck in 1902 dropped back into the abdomen strips of abdominal wall left attached at one end from each side of the abdominal wound and used them as supports for the suture material. Kocher in 1902 used compression forceps, crushing the liver substance, and removing them in twenty-four hours. In 1905 Cullen used overlapping mattress sutures 1 cm. from the line of section including all of the liver tissue. Payr and Martina[2] in 1905 introduced their absorbable magnesium plates through which catgut sutures were passed back and forth—a measure of practical value but not usually on hand. Dr. Jacob Frank in 1905 developed a plan of converting the broad raw surfaces left by the V-shaped resections, into troughs by taking out of each a wedge-shaped piece; the flaps of each side were then sutured together, leaving a notch where the V-shaped piece was removed. Dr. William J. Gillette,[3] controlled hemorrhage by passing sutures from within entirely through the liver substance and then through the abdominal wall, making exit between the ribs after the manner of a staple and tied them firmly on the cutaneous surface; gauze packing he found did not stay where placed.

Dr. M. Stamm[4] used cartilage plates from the scapula of the calf for liver and spleen suture. Stamm began using his plates in 1891 when Connell and Senn introduced the decalcified bone plates in intestinal surgery. They are taken from the cartilaginous portion of the scapula of the calf, which can be made ready at once and can be easily cut in any shape desired. William E. Schroeder[5] in 1906 reviewing completely the progress of liver hemostasis, reports cases, resections, sutures, etc., to that date. Reference should be made to Schroeder's article for full particulars as to the technic of the various operations; each procedure is carefully described and fully illustrated. Thomas S. Cullen[6] in 1907 claimed great value for the Kousnetzoff blunt liver needles which push the vessels to one side. The ordinary probe with an eye in one end answers the same purpose.

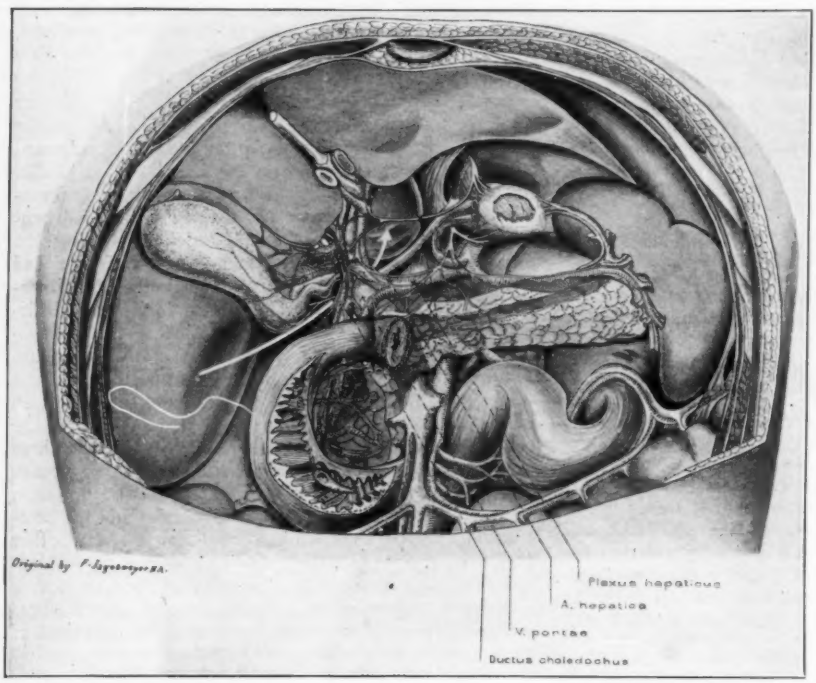

Fig. 1.—Showing the structures in the anterior wall of the foramen of Winslow. The stomach with most of the lesser omentum has been removed. The arrow passes through the foramen of Winslow. After Bardeleben and Haeckel.

Professor Garré, Breslau,[7] writing in 1907, states that no method can be introduced into practice unless it can be executed with the usual means, which every operator has at hand. He calls attention to the loss of time and blood in relying on the cautery, steam, etc., and to the facts that the vessel walls are firm enough for isolated ligature and that, as Auvray showed, they are elastic enough to be drawn out 1 cm. He believes that it is a mistake, when the liver is normal or soft and the blood-pressure low, to tie sutures too tightly. He prefers fine silk to catgut for ligations and large catgut for deep sutures. Garré has cut into the liver 10 to 14 cm. (4 to 6 inches) from the edge, in some of his resections; he always closes the abdomen and attributes great importance to this step. He is very careful not to stretch the vessels in cutting through the liver so that they will not retract into the liver substance and make hemostasis difficult; to vessels cut obliquely he applies circular suture.

J. Hogarth Pringle[1] in 1908 employed sutures passed far from the margin of the wound, pulled them tight cutting through the liver tissue until they were resisted

2. Payr, E., and Martina, A.: Arch. f. klin. Chir., lxxii, No. 4,

3. Gillette, William J.: Surg., Gynec. and Obst., 1905, i, 361.
4. Stamm, M.: Surg., Gynec. and Obst., 1905, i, 529.
5. Schroeder, William E.: Surg., Gynec. and Obst., 1906, ii, 52.
6. Cullen, Thomas S.: Surgery of the Liver, Surg., Gynec. and Obst., 1907, iv, 573.
7. Garré (Breslau): Surg., Gynec. and Obst., 1907, v, 331.

and held by the coats of the vessels. Pringle notes that this method of mass ligation was originally described by Kousnetzoff and Penski.[8]

Jacob Frank[9] in 1910 calls attention to the success of his methods in man which he established experimentally in animals. He resects by clean-cut incisions with careful regard to coaptation of the raw surfaces; he says that no raw surfaces or edges should be left and the coaptation should leave no dead spaces and closes the abdomen.

Boljarski,[10] in 1910, in a communication from the surgical department of the Petersburg Obuchow-Hospital describes sixty-five injuries of the liver, all of which were operatively treated; twenty-six cases were fatal. The sixty-five cases comprised fifty-five stab-wound injuries, thirty-two simple, twenty-three complicated, one complicated gunshot, one simple gunshot injury, eight subcutaneous ruptures of the liver, one complicated. The thirty-two simple stab-wound injuries gave a mortality of only 12.5 per cent. Boljarski says that the only correct treatment is immediate operation. The more quickly this is done after the injury occurs, the more favorable the prognosis will be. After two or three hours, there is 15 per cent. mortality; after four or five hours, 40 per cent.; after nine or ten hours, 66.6 per cent.; after twelve or fourteen hours, 83 per cent. mortality. The surgeon's main task in an injury of the liver is to control the bleeding. Suturing would be the best, were it not that frequently failures have to be recorded, because of the cutting through of the sutures. In sixty cases tampon was applied, and in three cases was combined with the suture. When tampon was used, the healing of the wound progressed very slowly; Boljarski believes that a thoroughly useful method is the one recommended by Loewy, namely isolated omentum plastic. This method was employed in five cases with advantageous results. Boljarski has also made experiments with this treatment, which, he asserts, show that combination of isolated omentum plastic with suture is among the most reliable hemostatic methods in the surgery of the liver. Isolated omentum plastic stops the bleeding and prevents secondary hemorrhage. While tying the suture the omentum protects the sutures from cutting through, and in case they should cut through, the spot will immediately be covered by the omentum. Halstead of Chicago in a personal communication stated that he had drawn the omentum through a large perforating wound of the liver with excellent result.

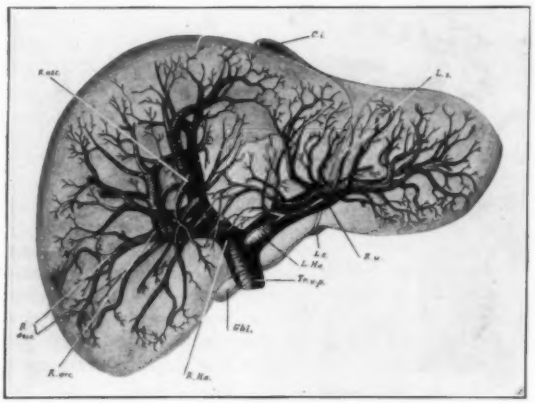

Fig. 2.—Corrosion specimen of the portal tree in man. The injection was made with the liver in position. G bl, gall bladder; Lt., ligamentum teres; Ls, ligamentum suspensorium; Ci, vena cava inferior; Tr. v.p. trunk of the vena porta; R. Ha; L. Ha, right and left main branches; Ru, recessus umbilicalis; R. arc, ramus arcuatus; R. desc, ramus descendens; R, asc, ramus ascendens. From Mall after Rex.

PROPOSED TECHNIC OF THE BLOODLESS OPERATIONS

When bloodless excision of a portion of the liver is determined on, avoiding harmful pressure, clamp the pedicle of the organ containing all of its blood-vessels, in the following manner: After the abdomen is freely opened anteriorly, through a 2.5 cm. (1 inch) skin incision just below the costal margin in the right axillary line, tunnel with forceps into the abdominal cavity, and through the opening pass a single enterostomy clamp 21.5 cm. (8½ inches) or 25.5 cm. (10 inches) long as required, armed with rubber tubing. Insert one branch into the foramen of Winslow behind and the other in front of the vessels and ducts far enough to include the hepatic artery and its occasional branch to the left, or about 5 cm. (2 inches). When the foramen is closed or narrowed by adhesions it is easily dilated. The blades of the clamp should not be very rigid and the ends should touch before the forceps is closed down. The nearer the compression is made to the duodenum the better, because here the vessels lie close together. This procedure gives absolute command over the liver circulation, which can now be turned on or off partially or completely as the operator desires. This clamp has exactly the proper curves and length for the purpose and the interval between the unlocked blades is a reduced outline of a cross-section of the pedicle of the liver; the handles and lock are outside of the body; the blades lying below the liver are out of the operator's way and it can be manipulated as desired or as directed.

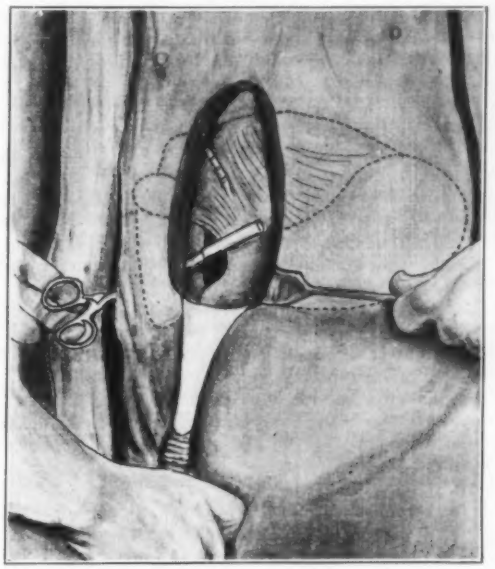

Fig. 3.—Showing the enterostomy forceps passed through the lateral abdominal wall and acting as a compression forceps on the hepatic vessels.

Ordinary limited resections and suture of wounds of the accessible portions of the liver can now be performed

8. Anschütz: Resection of the Liver.
9. Frank, Jacob: Surg., Gynec. and Obst., 1910, xi, 418.
10. Boljarski, N.: Injuries of the Liver in Clinical and Experimental Relations, with a Special Consideration of Isolated Omentum Plastic, Arch. f. klin. Chir., 1910, xciii, No. 2.

on a bloodless organ. More extensive resection and wound suture of the ordinarily inaccessible parts of the liver may require mobilization of the organ, and this is practicable, according to Ponfick and Langenbuch, by dividing its attachments to the diaphragm and posterior abdominal wall. Such access may be obtained in some cases by Langenbuch's division of the ligamentum falciforme hepatis and the right lateral ligament, which allows free dislocation of the liver forward into the abdominal wound. In cases in which the gall-bladder and ducts must be sacrificed, division of the ducts adds greatly to the mobility of the liver. Pringle suggests dividing some of the ribs in order to free and hold up a flap of ribs and diaphragm to gain room.

If the wedge of tissue excised is very large, and tension on the sutures, after approximating the resulting defect, threatens to result in their cutting through, I propose a support for them by means of a Martin gum bandage passed around the liver, as follows: A piece of thin, ordinary gum elastic bandage 5 cm. (2 inches) wide and 50 cm. (20 inches) long, is prepared by tying a long heavy silk ligature about its middle. The clamp with closed blades is passed through the small lateral abdominal incision, through the foramen of Winslow, across the lesser peritoneal cavity and on until by depressing the handle the end of the clamp is made to point and perforate to the left of the liver through the pars condensa omenti minoris, or the thinned-out extreme left end of the gastro-hepatic omentum, in front of the esophagus, then on through the ligamentum triangulare sinistra, or left lateral ligament of the liver; this ligament is composed of two layers of peritoneum with some fat, glands and a few unimportant vessels between.

The blades of the clamp are then opened to grasp one end of the rubber band, which is then drawn back behind and beneath the liver and out of the foramen of Winslow until the silk ligature can be reached and withdrawn outside of the foramen; the ligature is led outside of the body through the small lateral incision, alongside of the clamp. The rubber band is then slid back until the knot of the long silk ligature around it is at about the center of the lesser peritoneal cavity. One blade of the clamp is then placed behind and one in front of the pedicle as above described, ready to interrupt the hepatic circulation when desired. The object of the band, if needed after the excision, the hemostasis and the suturing are completed, is to support the sutures and assist hemostasis. If not needed it can be easily withdrawn; if, however, it is required, the end to the left which is passed through the gastrohepatic omentum, the left lateral and the falciform ligament are adjusted to the other end, and are then clamped together at the abdominal wound where they can be tightened or loosened as necessary. The silk left out through the opening in the side of the body is to facilitate the removal of the band; traction on it is exerted in a straight line on the left half of the band and should deliver it outside of the foramen of Winslow, after which the ligature is cut short and by traction on the right half the entire band may be brought out of the anterior abdominal wound.

CONCLUSIONS

1. Extensive liver resection for disease is limited to primary, single or closely grouped, accessible conditions; size may be no contra-indication, unless too near the portal vein or hepatic arteries. In all primary growths Tuffier's caution, carefully to determine glandular involvement along the vessels at the base of the liver, should be observed.

2. All procedures can probably with safety be made entirely bloodless for at least eight or ten minutes. By opening and closing the forceps the circulation can be turned partially or entirely on or off to avoid the danger of a too prolonged interruption. This controlled bloodstream also favors hemostasis by slowly filling up cut vessels and stitch-wounds with coagula; compresses to cut or wounded surfaces during a reestablishment of circulation would prevent undue loss of blood and allow of ligation or circumstitching of venous channels.

3. Great congestion of the gastro-intestinal branches of the portal system, blueness of the intestines, and subperitoneal ecchymoses while using the clamp indicate a dangerous degree of back pressure. The shorter the time of complete temporary arrest of circulation, the better.

4. The variability of the liver tissue and of degrees of portal pressure should be remembered; a marked chronic portal congestion should contra-indicate extensive operations.

5. Traumatic rupture of the liver occurs without any external evidence. Owing to structural arrangement, tearing of large vessels may result in continuous hemorrhage which is partially checked by reflex muscular rigidity and intra-abdominal tension; relief of this pressure on opening an abdomen allows of increased bleeding, unless immediate digital compression of the hepatic vessels is effected.

6. In favorable cases liver tissue can be removed to the physiologic limit under practically bloodless conditions, but further experimental work is necessary.

7. Chloroform is always contra-indicated in liver operations on account of the danger of sudden fatty degeneration and of necrosis and hemorrhage, due to the elimination of fibrinogen by the chloroform and inefficient coagulation, because fibrinogen is either formed wholly in the liver or is wholly dependent on liver activity for its production.[11] Use moderate ether anesthesia only because when the portal vein is clamped or dragged on respiration is embarrassed.

8. The clamp can be left *in situ*, open, to control a possible secondary hemorrhage.

9. The instruments required for this liver surgery are in the usual hospital armamentarium.

NOTE.—The excellent anatomic figures, Nos. 1 and 2 reproduced from drawings already published, were prepared under the direction of Mr. Elbert Clark, associate professor of anatomy in the University of the Philippines, and Fig. 3 was arranged by Dr. George Kleinschmidt of Milwaukee.

11. Whipple and Hurwitz: Jour. Exper. Med., xiii, No. 1.

Medical Fees.—An old story has it that once on a time a man called at the home of a physician in a small country town and asked him how much he would charge to go to a point five miles in the country. On receiving the reply that the fee would be $2.50, he told the physician all right, but to be in a hurry. The physician hastily dressed, hitched his horse and, taking the man in the buggy, drove in a lope the entire five miles. On arriving at their destination the man paid the physician the $2.50, informing him that no one was sick and that the liveryman would have charged $5 and would not have made such good time. The truth of the point of the story is driven home when we remember that we will drive across town and administer to the sick cheaper than a taxicab company would send a car with a $7 a week chauffeur.—J. C. Ayres in *Memphis Med. Jour.*

A SIMPLE APPARATUS FOR ADMINISTERING SALVARSAN INTRAVENOUSLY

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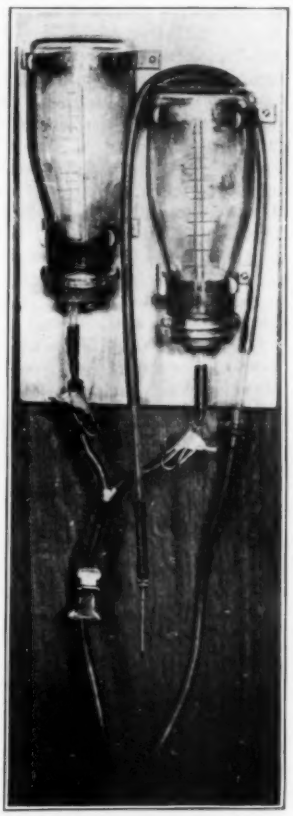
PROVIDENCE, R. I.

The intravenous method of administering salvarsan has come to be generally adopted as best and most efficient, but under the most favorable circumstances is rather troublesome. Anything which may contribute toward simplifying the methods will be most welcome.

I have devised a gravity apparatus which has some advantages in simplicity and cost over many others that have been described and it permits the introduction of salt solution both before and after the salvarsan is injected without any change in the connections. This apparatus has been successfully used in administering the drug in a good many cases at the Rhode Island Hospital and is now used by most of the operators there in preference to the syringe.



Gravity apparatus for the intravenous administration of salvarsan.

No provision is made for keeping the solutions at blood temperature during the administration. The fluid, however, is kept warm until ready to pour into the bottles. No discomfort to the patient has been noticed, though at times I have known the temperature of the fluid to be below 37 C.

This apparatus, as seen in the accompanying illustration, consists of two bottles and connections. The bottles are graduated upward from the neck (as the bottles are to be inverted), beginning at a point where the stopper ends in the neck of the bottle. One glass tube is inserted through the rubber stopper to within a quarter of an inch of the bottom of the bottle, to give vent. Another glass tube is inserted through the other hole in the cork to the internal surface of the stopper and allowed to protrude externally 2 inches. To the glass tubing protruding from the stoppers, a rubber tubing about 6 inches in length is attached. Thumb stop-cocks or metal clips are attached to the tubing. The distal ends of the tubing are attached to the Y-shaped glass tube. To the other end of the Y, rubber tubing is attached. Any convenient length may be used, preferably about a foot and a half. A thumb stop-cock or metal clip is attached to this tube. To the distal end of this rubber tube a glass tube about 3 inches in length is attached. A small piece of rubber tubing must also be attached to the needle which is to be inserted into the vein.

TECHNIC OF THIS METHOD

The whole apparatus is wrapped in towels (the bottles in one towel, the stopper and tubing in another) and sterilized. The apparatus, which consists of a square piece of board to which are attached two metal spring clamps, is hung on the head of the bed. The table is covered by a sterile sheet.

The salvarsan is mixed in a graduated cylinder in the usual way, warm sterile water and salt solution being used. The amount to be given is then poured into one of the bottles, and 0.9 per cent. salt solution is poured into the other bottle. The three thumb stop-cocks are closed. The rubber stopper is inserted into the bottle and the thumb held firmly over the air-vent on the stopper while the bottle is inverted and placed in the holder.

The holder of the salt-solution bottle is at a higher elevation than the one which holds the salvarsan bottle. The reason for this will be seen below.

The stop-cock on the tube below the salt-solution bottle and the stop-cock below the salvarsan bottle are opened. The salt solution runs by gravity through the tubing and forces the air into the salvarsan bottle. A few cubic centimeters of salt solution are allowed to flow until all the bubbles are out of the tube; then the thumb-clamp below the salvarsan bottle is shut off. The thumb-clamp below the Y is opened, the salt solution permitted to flow out, and the whole system is clear of air. The thumb-clamp below the Y is shut off.

The needle is inserted into the vein and when the blood flows freely from the tube the thumb-clamp below the Y is opened and while the salt solution is flowing the glass tube is inserted into the rubber tube attached to the needle. The salt solution is allowed to run into the vein until the operator is sure that the needle is in the vein. If the needle is not in the vein or the vein has been "buttonholed" a tumor mass will form by infiltration of the salt solution in the tissues around the vein. The salt solution is shut off, the other stop-cock opened, and the salvarsan flows into the vein.

As soon as the salvarsan reaches the level of the stopper, the cock is pinched off. The fluid should not be permitted to disappear below the glass tube protruding from the stopper. The salt solution is allowed to flow again until all the salvarsan is flushed out of the tubing into the vein, and while the salt solution is flowing the needle is pulled from the vein.

ADVANTAGES OF THE APPARATUS

1. The cost is low and the apparatus can be improvised by anyone.
2. It is practically a closed system. The vent in the rubber stopper is for all practical purposes a negligible quantity.
3. The flow of saline and salvarsan into the venous system is regular, steady and uninterrupted.
4. It can be manipulated by one person.
5. It is durable and not easily broken.
6. Air bubbles can be quickly and easily excluded from the system.

Rhode Island Hospital.

Pleasant Environment for the Tuberculous.—It is not difficult to make segregation of the tuberculous attractive. And, as part of the successful treatment of those segregated, it is necessary that it should be attractive. Real out-of-door life is well established as the basis of effective treatment, and it is not difficult to picture on out-of-door existence in a properly planned environment.—Urie in *Jour. Outdoor Life.*

THE TREATMENT OF CHRONIC INFLUENZA

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WASHINGTON, D. C.

Early last year I presented a brief monograph on "Chronic Influenza and Its Relation to Neuropathy."[1]

My interest in the subject of influenza as a chronic infection or intoxication has been increased by the study of an epidemic of influenza at Fort McDowell, California, during the winter of 1910 and 1911. The epidemic, probably imported by recruits *en route* to the Philippines from other depots, lasted several months. Involvement of the accessory sinuses was not uncommon. Singularly or perhaps naturally the cases in which sinus infection occurred presented evidences of general infection or intoxication for a period of one year during which they were observed. Two cases were followed closely and gave typical pictures of chronic influenza and one case was undoubtedly the source of endemic or sporadic influenza. Both cases showed a persistence of Pfeiffer's bacillus in the nasal and bronchial excretions during the time they were observed and had irregular acute exacerbations.

It is my purpose to emphasize what has probably been appreciated and practiced for many years by many of us, namely, therapeutic conservatism and caution in the treatment of acute conditions with the purpose of conserving the vitality and resistance as natural agents against chronic infections.

As early as 1900 Huchard[2] in the discussion of a similar subject said:

> Among the mild forms of influenza there are afebrile types without inflammation, yet with such profound influence on the nervous functions as to cause much moral, physical and intellectual depression. As influenza is one of the most powerful factors in lowering the resisting power of the body, these mild types should be recognized. The skin, liver and kidneys must be kept active, the stomach and intestines being treated by alimentation rather than by drugs. The mouth and nose should be cleansed by a solution of formol, menthol or phenol (carbolic acid).

Filatow[3] recognized two types of the chronic form of influenza: "(1) a type characterized by permanent fever of a remittent or intermittent character, that is, prolonged for several months, and followed by (2) a return of the disease for brief periods of time."

The most constant and striking influence following epidemics of influenza is the marked impairment of vitality and resistance with great increase in mortality and morbidity statistics from diseases directly attributable to influenza for many months and years after the epidemic. The protean manifestations of influenza as a chronic disease can well be appreciated by reference to the volumes of cases in the medical literature. Chronic influenza is more protean in its manifestations and less frequently recognized than any disease condition. It has become a habit, even a pernicious custom with some of us to treat disease empirically or by symptomatic eclecticism. This has in no one disease been more pernicious than in influenza in which the numerous "algias," widely distributed throughout the body accompanied by great mental depression, seem to demand attention only to the immediate relief of symptoms. It is not remarkable that influenza should become a chronic infection, followed by innumerable complications and sequelæ, lowering the vitality of its victims, productive of neuralgia, neurasthenia, psychasthenia, insanities, more or less serious, organic, pulmonary, cardiac, abdominal and pelvic disorders, so long as "grip" continues to be a disease entity without a full appreciation of its gloomy prognosis.

Antipyrin, acetphenetidin, salophen, salicin, aspirin and the host of similar antineuralgics have no virtue in the treatment of acute influenza, but rather tend to the production of complications and sequelæ, markedly increasing the tendency toward chronic infection. Hexamethylenamin, another "therapeutic fad" in the treatment of influenza, I have found in this disease as well as in its complications to be without merit. The relief of the neuralgias of influenza by the local stimulation of the circulation by hydrotherapy proves the correctness of Romberg's saying that, "pain is the prayer of the nerve for better blood." Depressant phenetidin and coal-tar derivatives increase the volume of the toxic agent causing the pain, and further impoverish the physiologic effect of good blood. Burney Yeo[4] justly protests against "the reckless use of such drugs as salicin and antipyrin" on the ground that "tedious convalescence and cardiac debility are encouraged." The German committee which was formed after the epidemic of 1892 concluded that drugs had been abused in the treatment of influenza and that "rest in bed, the shunning of drastic agents, and above all, curbing the desire to leave the sick-room" until the noxious organism and its toxins are entirely eliminated from the system are rational procedures.

During acute influenza it is of first importance that our patients should be given the best possible chance to recover from the acute manifestations of the disease with the minimum amount of prostration and depression and to avoid as far as possible the occurrence of complications. Influenza is in its incipiency admittedly an inflammatory infection of the upper air-passages caused by a specific organism.

I am convinced that depressant antineuralgics have no place in the treatment of influenza, that their effects are harmful and tend to the production of great general depression and lowered vitality in a disease which is characterized primarily by great cortical and bulbar depression, and which tends to become chronic in proportion to the degree of immediate resistance.

The first step in the treatment should be the removal of the immediate cause, namely destruction of the organism via the avenues of invasion. At all times the symptomatic treatment of the disease should be made subsidiary to the destruction of the bacillus of Pfeiffer by local treatment of the air-passages and conservation of vitality and resistance by environment and natural agents, i. e., ventilation, alimentation and elimination.

The following procedure has proved satisfactory in the local treatment.

In the morning:

1. Thoroughly cleanse the nose and throat with a spray of Dobell's solution or 1 to 400 phenol solution at a temperature of 85 to 90 F.

2. Swab the nose and throat with

℞.	gm. or c.c.		
Balsami peruviani	.6		gr. x
Ichyolis	.3	or	gr. v
Glycerini qs.	ad 60.		ʒii

In the evening:

1. Repeat the spray of Dobell's or phenol solution.

2. Have the patient inhale for one-half hour creosote, 8 c.c. to a quart of water.

1. Am. Jour. Med. Sc., February, 1911.
2. Huchard, H.: Bull. de l'Acad. de méd., March 5, 1900.
3. Filatow: Ann. de méd. et chir. inf., April 1 and 15, 1899.
4. Burney Yeo: Lancet, London, March 2, 1895.

3. Swab the nose and throat with epinephrin.
4. Fifteen minutes later swab with argyrol, 10 per cent.

This procedure will probably be rejected by the busy practitioner or objected to by the patient. In my opinion it is the failure to treat the local infection in acute influenza that has resulted in the frequent complications and sequelæ producing chronic infection.

The evidence in favor of chronic invasion in influenza is so conclusive that we must cease to underestimate the malign effect of this disease on the public health and take radical measures to effect complete recoveries in patients suffering from acute "grip."

Hydrotherapy is of inestimable value in all cases of chronic influenza, acting as tonic, stimulant, eliminant and by enhancing phagocytosis. The observation of Winternitz[5] confirmed by Alois Strasser[6] in health and disease that, "after all thermic and mechanical procedures acting on the whole surface, as in cold sheet baths, plunges, half baths, all kind of douches, hot-air baths followed by cold procedures, Scotch douches, and cold full baths, there is an increase in the red blood-corpuscle count." "The leukocytes almost without exception also increased, as did the hemoglobin." Strasser[7] formulates the results of observations to determine the effect of hydriatic procedures on elimination and assimilation as follows:

"Hydriatic procedures constantly increase the assimilation of nitrogen, the increase differing in intensity in different individuals; a diminution of body albumin does not necessarily occur if the nutrition is sufficient, but on the contrary even during the procedure albumin may be added." "Reaction does not seem, in the majority of cases, after a duration of three days' treatment, to exceed the effect of stimulation." "Nevertheless a larger number of clinical observations have established the fact indubitably that *assimilation is decidedly and enduringly enhanced* by water treatment provided, the latter is sufficiently prolonged."

I believe that we have in hydrotherapeutic measures a valuable agent in the treatment of chronic influenza, provided as much care be taken in prescribing the temperature, pressure and duration of baths of any kind as is taken with the minute instructions to the patient for medicinal agents.

Patients with prolonged indisposition and great depression accompanied by persistent cough, excretion of Pfeiffer's bacillus and irregular recurrence of fever with exacerbation of acute attacks, should be recommended to a climate which shows slight changes in extreme alterations of high and low temperature and barometric pressure and where relatively clear and sunshiny days predominate. Tropical or subtropical climates are bad for influenza by lowering resistance and increasing local congestion.

5. Winternitz: Bl. f. klin. Hydrotherapie, February, 1893.
6. Strasser, Alois: Bl. f. klin. Hydrotherapie, November, 1893.
7. Strasser: Hydrotherapy, Baruch.

EXTENSIVE DERMATITIS MEDICAMENTOSA, FOLLOWING THE USE OF MIDOL (PYRAMIDON)

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A note[1] on the entrance of pyramidon in the "patent medicine" field, under the name of Midol, recalled to my mind the following interesting case, on file among my records:

The patient, a man aged 52, with a tabes dorsalis of fifteen years' duration and a marked accentuation of the lightning-like pains, had been taking acetanilid for several years. He claims to have taken at times as much as 40 grains in the twenty-four hours. He has also occasionally taken morphin, but finds that acetanilid gives him more relief. For some weeks there occurred a considerable amelioration in the pains, during which time all medication was discontinued. Several weeks later and about a week before the case came under observation, the pains recurred with increased severity. After taking one or two doses of acetanilid with little or no relief, he began taking Midol in full doses for four days, at the end of which time he began to have considerable pruritus and irritation back of the ears and on the neck, which within a few hours involved the trunk. The itching was very severe, the patient's sleep being disturbed. This condition progressively increased, until when seen three days after the onset of the trouble, he presented a severe dermatitis medicamentosa. The lower lip was enormously swollen and edematous, rendering speech difficult. There was an extensive erythematopapular eruption on the face, chest and back; the papules were very large. There were also several very itchy wheals, some of which were over an inch in diameter. The patient complained of an intense pruritus of the scalp, but nothing other than scratch-marks could be seen. The skin was markedly hyperesthetic. A large number of purpuric spots were observed on the anterior aspect of the legs and feet. I immediately forbade further use of the Midol, and prescribed an alkaline, laxative mixture. For external use the patient was given a lotion of magnesia and zinc, with some ichthyol. Within three days the eruption cleared up entirely, only the purpuric spots remaining, but these eventually disappeared after a few weeks. This case proves that pyramidon can as easily cause a drug eruption as the other better-known coal-tar derivatives.

40 East Forty-First Street.

1. THE JOURNAL A. M. A., August 10, p. 461.

CONGENITAL DEFECT IN AN ARMENIAN

A. R. HOOVER, M.D., TALAS, CESAREA, TURKEY

The subject of the accompanying photograph is a strong young Armenian lad of 19 years. He is one of a family of five, two members of which were twins who died in infancy; the others are alive and well. There is no history of consanguinity or physical defect as far back as the grandparents; the earlier family history is not known. I have known the patient for one year; he is in regular attendance at school, and seems to be in exceptionally good health.

Congenital deformity in an Armenian.

ANURIA FOLLOWING THE INTRAVENOUS ADMINISTRATION OF SALVARSAN

GEORGE R. LIVERMORE, M.D., MEMPHIS

C. S., white, man, aged 19, had a chancre in May, 1911. Mucous patches appeared in the mouth one month later. He was treated in Birmingham for six months, with protoiodid of mercury pills, but has had no treatment for the past month, and no further symptoms. Examination showed no evidence of syphilis, except general adenopathy. The heart, eyes, lungs and kidneys were normal.

An intravenous injection of 0.55 gm. salvarsan was given in a hospital at 9 a. m., July 2, 1912. Temperature was 98.6; pulse, 60 and respiration 20. At 10 a. m. the patient complained of headache and vomited 8 ounces of yellow fluid. He slept for one hour; then had large soft bowel movement. Temperature was 105; pulse, 106 and respiration 34. The temperature gradually fell to 101 at 6 p. m. The bowels moved at 6 p m. and again at 12 midnight. The patient voided urine both times, but only a small amount at midnight. The bowels moved again at 6 a. m. the next day, but no urine was passed. At 9 a. m. the temperature was 101.4; pulse, 100 and respiration 34. The patient seemed drowsy and said he felt sick all over. He was given 8 ounces of saline per rectum; nitroglycerin 1/100 grain hypodermatically, and a hot-water bottle was applied over the kidneys; also plenty of hot water by mouth. At 2:30 p. m. temperature was 102; pulse 108 and respiration 30, and the patient had voided no urine. He was given strychnin 1/30 grain and nitroglycerin 1/100 grain hypodermatically every four hours, and a hot pack for ten minutes, with hypodermoclysis of 1 pint of saline solution. At 4 p. m. the patient vomited a large amount of dark green fluid. The hot pack was repeated at 6 p. m., and potassium bicarbonate (30 grains in one-half glass of water) was given. At 9 p. m., he vomited 10 ounces of greenish fluid. Saline solution by the Murphy method was begun at 9 p. m., and continued through the night. At 9 a. m. July 3, calomel one-half grain every half hour, for six doses, and theobromin sodium salicylate with essence of pepsin every four hours were given. Patient vomited 12 ounces of greenish fluid at 9:30. Murphy drip was continued. The bowels moved at 11 a. m. and again at 12 m. At 2 p. m. the patient was catheterized, and 5 ounces of urine were obtained. Murphy drip was continued through afternoon and night. At 8 p. m., 6 ounces of urine were obtained by catheter. The patient vomited several times during the night, and the bowels moved three times. From this time on, he voided urine in sufficient quantity, and made a good recovery. The first urine contained a large amount of albumin, and all kinds of casts. Subsequent specimens have improved till now they contain no albumin and few hyaline casts.

The only explanation for the suppression of urine is an idiosyncrasy for arsenic. The technic employed was the one I always use. The solutions were made with pure distilled, sterile water, and the patient's urine was normal in every respect before salvarsan was given.

NON-ADHERENT MEMBRANOUS PATCH IN PERICOLITIS

VICTOR F. MARSHALL, M.D., APPLETON, WIS.

The literature is replete with numerous contributions by various authors concerning membranous pericolitis, Jackson's membrane and other terms designating the same condition, with many theories as to its etiology. I cannot add anything to the present conception of this condition, but wish merely to report the following with the hope that it may serve to throw light on the pathology of this rather obscure condition.

Miss M., aged 19 years, was operated on at Theda Clark Memorial Hospital, Neenah, Wis., Aug. 17, 1912, for right-sided pain confined to the right hypochondriac and ileocecal region. The attack was of two days' duration. Temperature was 99.5 F., pulse 90. Constipation and some anorexia were present, but no vomiting. There was rigidity of the right rectus muscle. The urine was normal. A diagnosis was made of an appendicitis or a pericolitis with bands or perhaps both together. Through a right rectus incision the appendix, which was slightly congested, was removed. The pericolitic condition was very pronounced and several bands running transversely over the ascending colon and cecum, producing constriction, necessitated division. On further investigation the left side of the abdomen proved to be negative, but a very pronounced patch several inches in area of this membrane was noted on the peritoneal surface to the left of the umbilicus. It was non-adherent to the adjacent underlying viscera.

A HOME-MADE INFANT INCUBATOR

FRED E. LEAVITT, M.D., ST. PAUL

Many improvised infant incubators have been devised, but for simplicity of construction and uniformity of heat, one made by Dr. D. D. Turnacliff of the Midway General Hospital, and shown in the accompanying illustration, has proved as satisfactory as any we have used, not excepting the more elaborate and expensive sort in common use.

A home-made infant incubator.

A table, a metal stand, rubber gas-tubing, a thermometer, a piece of string and two infant bath-tubs were all the parts used, except an ordinary gas-regulating glass tube and an incubator lamp from the laboratory. The lower tub was partly filled with water in which rested the upper or outer tub with the baby. The thermostat was regulated to keep the water at a uniform temperature of 40 C. (104 F.).

Where neither gas nor the thermostat are to be had, the water may be kept warm by means of a small kerosene lamp, a night lamp, or even by a tallow candle.

The apparatus is so simple and so easily extemporized that its use need not be limited to premature infants, but will be of service whenever a delicate or feeble child needs artificial heat constantly applied.

A PECULIAR CASE OF COMMON SALT POISONING

O. H. CAMPBELL, M.D., ST. LOUIS

The patient, R. G., was a healthy boy of 5 years. Parents were living and well. Patient had had mumps at 4 years and measles at 3 years; no other illness. This summer he had not slept well and the mother believed that the child might have worms. On the advice of a friend the mother decided to administer a salt enema. The suggestion had been to use one tablespoonful in a quart of water, but she misunderstood and used one pound of salt in a quart of water.

The enema was given at 5 p. m., July 13. In from five to ten minutes the child cried, with severe pains in head, became intensely thirsty, vomited violently, and soon began to purge violently; within thirty minutes he became unconscious and had one convulsion after another. I saw him at 6:30 p. m. and found him unconscious and unable to swallow, with one clonic spasm quickly following another. The temperature was 99.2, pulse 150, bowels moving often, passing blood and mucus. At 8 p. m. the temperature was 102.5, pulse 170; the eyes were crossed, and all of the symptoms seemed worse. At 9 p. m. the temperature was 104.6, pulse about 200. All of the symptoms seemed worse and continued to increase in severity until 10 p. m., when the child died. I was unable to have a post-mortem examination. I have searched the literature carefully but can find no parallel case.

3542 Washington Avenue.

COMMON SALT AND CONSTIPATION

L. S. HINE, M.D., OAKALLA, TEXAS

The use of common salt in constipation is not new, but the remedy appears to have been neglected. This is doubtless owing to improper technic in its administration. I have tested the following method of giving it and have prescribed it to a considerable number of patients, many of whom were seriously constipated. The solution should be taken on an empty stomach, preferably before breakfast; in some cases it is desirable that the patient should also have omitted supper. A pint of sterilized water, hot as hot coffee, with the addition of a couple of teaspoonfuls of table salt, constitutes the morning dose.

Instruct the patient to sit down by the steaming bowl and sip the solution by the tablespoonful, to take time for it, not to be in a hurry, and to breathe deeply. This last is a stimulus to peristalsis. This dose is followed by an evacuation within a short time—from one-half to one hour. The passages are watery, but differ from those produced by saline cathartics in that the common salt carries off scybalous matter and plugs of débris which the colon is so prone to retain. This method is effective not only with young people but also with those of advanced years. It is also useful as an occasional laxative.

Therapeutics

FIRST AID IN THE FAMILY

A discussion of first aid in the family does not concern the treatment of serious injuries like drowning, overheating, sunstroke, epileptic convulsions, apoplexies, etc., but should be restricted to slight disabilities or ailments. It certainly is unwise, and is not advocated in this article, to encourage a layman with a small, if any, amount of medical knowledge, to treat a patient for even twenty-four hours before the physician is summoned.

If it is advisable in cities, or if it is a necessity in a small community remote from immediate medical aid, for a family to be prepared to treat simple injuries; fainting; simple gastro-intestinal disturbances as vomiting, constipation or diarrhea; beginning colds of the nose, throat or bronchial tubes; or some sudden rise of temperature, it is well to outline what the family may safely use and should have in some cabinet or closet.

This family cabinet might well contain such articles as a graduate, medicine-droppers, water-bags, a fountain syringe, a Davidson syringe, some simple antiseptic for external use (as advised by the family physician), simple laxatives and cathartics, a pure castor oil (with instructions as to the best method of administering it), boric acid, hydrogen peroxid solution if frequently renewed, tincture of iodin in an air-tight bottle and not too long kept, some simple emetic as mustard or syrup of ipecac, some simple antiseptic, a soothing ointment (as suggested by the family physician), good whisky or brandy, aromatic ammonia in an air-tight bottle, smelling-salts, pure sodium bicarbonate, perhaps essence of peppermint, oil of cloves for a sore gum or an aching tooth, some simple mouth-wash or gargle, etc.; in other words, simple external and harmless internal drugs or preparations. The cabinet should contain several sorts and sizes of bandages and simple appliances for minor injuries. Printed instructions should describe the best "first" treatment for a burn, and picric acid should not be part of this emergency treatment. Picric acid can do a great deal of harm when misused on burns, and the exact way it should be used, and the amount, should be determined by the character of the burn and what the surgeon deems advisable. Picric acid should not be a household remedy.

The family should not have or use, without a physician's instructions to some certain person for some specific reason, any strong cardiac, narcotic or soporific drug. Some of these preparations may do harm; others are useless, and the laity should not be encouraged to have faith in a preparation or drug that is worthless. It is much better to teach them a mental science cure, or give them psychic treatment.

SOME PREPARATIONS WHICH SHOULD NOT BE HOUSEHOLD REMEDIES

The following "don'ts" apply to drugs which have at times been recommended to families for use in emergency, or have become household remedies through their having been frequently ordered by physicians; it is as good a rule for the layman as for the physician never to do any harm whatever else may be done:

1. It is unjustifiable to allow a layman to use a drug like aconite in any form, especially in the form of a strong tincture of the root, to say nothing of the fact that the solution might become stronger by evaporation of alcohol if long kept, or might deteriorate in other respects. If a physician thinks that a given family should have an aconite or cold tablet preparation, he can furnish it with his pet "rhinitis" or "cold tablets," with full instructions how they shall be taken. The only possible use to which the family could put, or should put, aconite would be in a beginning cold. No one would advise its use by a layman in a possible beginning pneumonia.

2. The same discussion under aconite will apply to gelsemium. The only possible excuse for a family having gelsemium would be that a member of it had recurrent pain in a nerve and gelsemium had been found to be of value. This then is not a family remedy, but a specific one for an individual.

3. A frequently used substance is sweet spirit of niter. In the first place, it more or less rapidly deteriorates, depending on the temperature and the frequency with which the bottle is opened. To be of value as sweet spirit of niter, it must be freshly prepared. When freshly prepared, this solution is neutral to litmus paper, but when long kept, especially if exposed to the air and light, it acquires an acid reaction. It readily loses its nitrous ether, and then could have no action for good, even if its activity when pure and fresh is considered efficient.

While many physicians believe that sweet spirit of niter has valuable diaphoretic and diuretic activities, others believe that such action is largely a matter of hereditary belief. If pure, it certainly does no harm, and may do some good. Small doses given frequently in hot water or hot lemonade, with the patient warmly covered up or in a warm room, certainly tend to promote sweating. Whether the hot lemonade would not work as well is a question for each physician to decide. On the other hand, if it is given in larger doses, at less frequent intervals, in ice-water, with the patient in a cool room and kept cool, diuresis may be caused. Whether this also has much to do with the action of the drug, or is due to the ice-water and the rest of the treatment is another question for the physician to decide. Certainly, as a remedy to retain in the household cabinet it is inadvisable. It should be freshly obtained from a trustworthy druggist.

4. A much lauded preparation for use in various upset conditions of the stomach is the official mixture of

rhubarb and soda. While it can do no harm, it seems unwise ever to recommend it for family use.

The official mixture of rhubarb and soda contains:

	gm. or c.c.		
Sodium bicarbonate	3	5	gr. lxiv
Fluidextract of rhubarb..	1	5	♏ xxx
Fluidextract of ipecac....	0	3 or	♏ vi
Glycerin	35	0	fl.℥ xii
Spirit of peppermint.....	3	5	♏ lxxii
Water, enough to make..	100	0	fl.℥ iv

This is a mixture that has for many years been largely used in most hospitals. The young doctor starts out in his individual practice with an enormous amount of faith in this disagreeable-tasting preparation. No one can question that the ingredients are valuable, and if any physician wishes to use this preparation in preference to some other gastro-intestinal treatment, nothing can be said against his decision. On the other hand, some patients are nauseated by it, largely because of the glycerin, perhaps; the rhubarb may be too active, or inefficient, and another laxative must be given; and the amount of alkali may be totally insufficient for what is desired. The scientific physician, who thinks it is as wise to fit his prescription to his patient as it is to make scientific examinations positively to determine his diagnosis, will rarely find it advisable to use this mixture. If the patient needs a cathartic, he needs it at once. If he needs a laxative (three times a day, or more frequently, as the above is generally administered), the mixture is generally unsatisfactory. As such it either does not act at all, or it causes too frequent movements. If it does not act at all and is useless, why have the disagreeable-tasting rhubarb in the preparation? The minute does of fluidextract of ipecac, each teaspoonful or 5 c.c. containing but 0.015 gm., or about one-fourth minim, makes its addition an absurdity, and it is quite probable that most physicians who order this mixture have forgotten that it contains a fluidextract of ipecac. But why continue to use a mixture, or why require its officialization in the Pharmacopeia, when it contains ingredients that have no activity, especially in the dose presented?

If a gastro-intestinal condition requires an alkali, it is better to give it in an amount that is of value, possibly combined with a bismuth.

That glycerin is of value as a laxative and as an antiseptic, and that peppermint is a good carminative, there can be no question; but glycerin is rarely ordered except in a mixture to be taken internally, perhaps not frequently enough. Probably few physicians remember that the mixture of rhubarb and soda is really a glycerin medication.

The matter resolves itself into the following sequence of events: The patient requires some gastro-intestinal treatment. He is given a cathartic, his diet is regulated and a prescription is written for the mixture of rhubarb and soda. The patient improves or recovers, and the physician is sure the rhubarb and soda mixture did it. As a matter of fact, it is probably the glycerin, or at least the treatment did him no harm. In other words, it is the prescription plus faith and glycerin.

This digression in the discussion of household remedies is not to ridicule either the preparation or the treatment, but is to urge the physician to analyze the mixed preparation that he orders to see what its actual value is, and to decide if that mixture is really just what he desires for his patient, and to urge him not to order by hospital routine.

5. Another much-lauded home remedy, even carelessly recommended by physicians to the laity, is "Sun cholera mixture." This preparation is frequently bought and used indiscriminately, and often does harm. It is generally inadvisable to stop a diarrhea immediately, as it shuts up in the intestines a lot of putrefactive and fermentative material that should be evacuated. In other words, it may cause a prolonged diarrhea and actual enteritis unless the bowels are relieved. Therefore in the first stage of a diarrhea Sun cholera mixture would generally be positively contra-indicated. In the second stage when retardation of intestinal peristalsis is often advisable, the physician who prescribes Sun cholera mixture is prescribing a nostrum, and 0.1 grain of morphin used infrequently, or paregoric if one prefers, will act as satisfactorily.

While there may be several formulas of Sun cholera mixture, the following is one:

Laudanum
Spirits of camphor
Tincture of capsicum
Essence of peppermint
Tincture of rhubarb, equal parts

It does not seem necessary to use the above mixture, or to advise its retention as a household remedy.

6. Favorite cough syrups with druggists and with physicians, and therefore used by many people for coughs and colds, are the compound syrups of white pine, of which there are a number on the market. Some contain sedatives, as heroin or codein; others do not. All are sweetish, stomach-disturbing mixtures. It cannot be too frequently repeated that the presence of a cough is no reason for upsetting a patient's stomach by sweet, syrupy cough mixtures, and it is always inadvisable. If ammonium chlorid is needed it should be given in a sour mixture or administered in lemonade. If terpin hydrate is advisable, it should be given in sufficient dose to be of value; the dose in liquid preparations is insufficient for adults. Terpin hydrate is very insoluble, and no teaspoonful of liquid can contain more than 0.12 gm., or 2 grains, if it contains that. The adult dose is 0.3 gm. (5 grains) every four hours. As it is tasteless, it can be administered in a tablet, to be crushed, or in powder. It is a question whether there is any real good pharmacologic or therapeutic reason for administering a syrup of white pine.

7. Turpentine in some form is often used by the laity. A rectified oil of turpentine might be kept on hand for preparing hot stupes for applications to the abdomen or other parts of the body. It might be added to weaker liniments to make them more irritant; but if used carelessly it can cause blistering, and it really seems hardly necessary to have it in an emergency cabinet to be used without instructions from the physician.

8. Narcotics, such as morphin, codein or heroin, are rarely advisable for a household to possess. If one of these drugs is needed in a special family, for a special patient, for a special reason, the family physician should decide which it should be, and the strength.

It is rarely advisable for a family to possess a hypodermic syringe, and then only for some specific reason. Every family will have pain somewhere sometime. If that pain recurs, a patient might ascertain that not only the morphin, but the combination of the hypodermic and the morphin will quickly stop it, and the habit be readily acquired.

Even in small doses, and even used just for a cold, heroin is inadvisable for household use, and should

never be in tablet form or in cough mixture form, unless the physician prescribes it.

9. A clinical thermometer in the family is generally inadvisable. The watching of the rise and fall of any child's temperature is something to be deprecated, unless the mother is particularly sensible, or her physician at a distance.

EMERGENCY TREATMENT OF SIMPLE DISORDERS

Now, specifically, what could well be in such an emergency cabinet? First we may discuss acute colds, and the family (and this means the mother) should understand the value of diminished food or total abstinence for a short time; the administration of some simple hot drink, as hot lemonade; the value of a hot bath and putting the patient to bed, and the value of a simple cathartic as the proper dose of licorice powder, castor oil, some preparation of cascara, a compound aloin tablet, a Seidlitz powder, or an effervescent sodium phosphate. The household could well have a few tablets, with proper instructions, of the family physician's rhinitis formula. Hydrogen peroxid in proper dilution and boric acid in saturated solution may be recommended by the family physician for gargles in the strength and frequency which seem to him advisable for use until he sees the patient. Some simple throat or mouth wash, as an alkaline antiseptic tablet (Seiler's formula) in solution or the Liquor Antisepticus Alkalinus N. F., diluted, are pleasant, efficient sedative preparations to have on hand. The composition of Seiler's antiseptic tablets is as follows:

	gm.	
Sodium bicarbonate	30 00	ʒ i
Borax	30 00	ʒ i
Sodium benzoate	1 30	gr. xx
Sodium salicylate	1 30	or gr. xx
Eucalyptol	0 70	gr. x
Oil of wintergreen	0 25	gr. iii or iv
Menthol	0 35	gr. v

Mix and make into tablets of 1 gm. (15 grains) each. (From Hager's "Handbuch der pharm. Praxis," 1903, p. 502.)

The mother should be taught that an acute diarrhea, with or without vomiting, should first be treated with a cathartic, and that no food, except possibly milk if deemed necessary, is advisable, with the administration of possibly some bismuth subcarbonate and phenyl salicylate (salol) powders, in such doses as the family physician deems best for the family to have on hand. The family should understand that with or without vomiting diarrhea gets well quickest when the patient is kept in bed and the abdomen kept warm.

If there is vomiting for any reason, the greatest sedative is large draughts of hot water until the vomited liquid is clean; then give nothing, except possibly an alkaline effervescent like vichy, possibly pieces of ice to suck, possibly one of the bismuth powders perhaps with a little sodium bicarbonate as previously named, and perhaps a mustard paste or paper on the abdomen.

If there is much fever with or without any of the above-mentioned causes, the mother should be taught that a purgative, the withholding of food, sponging of the patient with first hot water then perhaps later with tepid water, the sucking of ice and the taking of cool drinks are the only ways of reducing temperature that she should undertake without the orders of her physician.

The most frequent physical disorder of the American people is constipation, and it is the most mismanaged of all disturbances. The mother should know that the way to cure constipation is to prevent it, and the children should be taught (particularly girls) that one special time of day should be allotted to the movement of the bowels, preferably after breakfast. The child or adult should attend to this matter whether there is immediate desire or not. It is not the purpose of this article to discuss the various causes of constipation; it is sufficient to state that the articles of food which are distinctly laxative should be listed for the mother, and then she may administer or withhold these depending on the condition of the child's bowels. The various simple fruits, especially taken at supper-time, or an apple or orange at bedtime, are conducive to a movement of the bowels in the morning. Plenty of cold water on arising or while dressing in the morning is conducive to the movement of the bowels after breakfast. The consequences of troublesome and prolonged constipation should be stated to the mother of the family and the importance of proper care of the bowels urged. Young children will take sufficient exercise, but older persons with constipation often do not have sufficient exercise, and exercise, even walking, will lessen constipation. The family should distinctly understand that it is a serious mistake to take a cathartic frequently, and that it is to be regretted when a laxative must be constantly taken. This is more especially true with the young: it means that soon they will be wedded to the habit. Later it is not serious if a laxative tablet must be taken daily, provided that this represents drugs which do not make the condition worse or cause a necessity later for larger doses. The women of the family should be told that long corsets are not conducive to proper evacuation of the bowels, and that to obtain the best position for normal bowel movements the individual must be able to lean over and not sit upright.

The best laxatives are vegetable drugs, and of these aloes and cascara sagrada are the most valuable from all points of view. Cascara varies enormously in its activity and its purity, and the family physician should aid in deciding which preparation is the best for the family to keep on hand. Aloin represents very well the activities of crude aloes, and the addition of other drugs to it, to prevent griping, makes a tablet that has long proved itself of great value. A very good formula for an aloin tablet, in dose sufficient for an adult who has long been constipated, and a tablet that will not necessitate increase of the dose, is as follows:

	gm.	
Sulphate of strychnin	0 0015	gr. 1/40
Aloin	0 02	gr. ⅓
Powdered ipecac	0 03	gr. ½
Extract of belladonna	0 006	gr. 1/10

Inflammation of the eyes or ears, and especially pain in the ears, should immediately call for advice from the family physician. Of all neglected parts of the body, the ear is probably the most neglected or mismanaged. Even the family physician should quickly recognize that the ear needs the treatment of a specialist.

A swollen joint, or even a pain in a joint should be tampered with only a few hours by the family. Such a condition calls for the diagnosis of a physician.

It is presumed that with the general education of mothers as to proper ventilation, proper clothing, proper diet, etc., for her children, she is also taught how to care for the mouth and teeth. Cleanliness and care of the teeth constitute not an emergency, but a daily promoter of the general health.

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[For other information see second page following reading matter]

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IS FAT AN INDISPENSABLE DIETARY COMPONENT?

The proximate principles — proteins, carbohydrates and fats — are so indelibly associated with the nutritive requirements of the animal organism that it almost awakens a sense of the ridiculous to inquire whether these foodstuffs are all in truth indispensable to the body. Life without protein is equivalent to life without nitrogen, a manifest impossibility. Perhaps, in view of the recent feeding experiments of Abderhalden,[1] in which the completely digested fragments of protein, the amino-acids, have been used with apparent success for nutritive purposes, we ought rather to speak of proteins or their constituent amino-acid complexes as essential for prolonged existence. The effect of a lack of carbohydrate is familiar to the physician in the manifestations of acidosis and ketonuria by which it is accompanied. The exclusion of starch and sugar from the diet for even a day or two leaves unmistakable evidences of pathologic consequences in otherwise healthy individuals.

How about omission of fats? This question seems scarcely to have been asked. Technically it is a difficult one to approach in an experimental way; for practically every familiar food material which enters into the customary dietaries contains some modicum of fat or fat-like material, which can be removed completely only with the expenditure of considerable effort and skill. These inherent difficulties probably explain why this apparently fundamental question in nutrition has not been answered before.

Osborne and Mendel[2] have lately approached the problem in feeding experiments with mixtures of isolated food substances conducted on rats. They succeeded in inducing adequate growth in these animals over periods of many weeks on diets of fat-free foods. So far as one can judge the results were quite as successful as in the growth which follows the ingestion of the natural diet of the animals. Incidentally it may be noted that their dietaries were essentially "lipoid-free," so that the vexed question of the rôle of the "lipoids" is again opened for discussion. It is interesting to speculate on the chemical character of the tissue-fat which must have been manufactured out of non-fat precursors in the experiment of Osborne and Mendel. After all, the results need not surprise us when the well-known use of skimmed milk as an almost exclusive ration in the case of certain growing animals is brought to mind.

1. Compare Abderhalden, E.: Synthese der Zellbausteine in Pflanze und Tier, Berlin, 1912.

2. Osborne, T. B., and Mendel, L. B.: Feeding Experiments with Fat-Free Food Mixtures, Jour. Biol. Chem., 1912, xii, 81.

PARABIOSIS AS AN EXPERIMENTAL PROCEDURE

Although the possibility of the successful permanent union of two animals of the same race has been known for many years, it received no serious attention as a method for the investigation of pathologic problems until 1908.[1] Sauerbruch and Heyde introduced the word "parabiosis" to designate the outcome of the surgical union of two individuals, with a resultant mutual anatomic independence. To Sauerbruch and Heyde and to Morpurgo, in particular, we owe the development of the technic by which two animals are united either by means of bridges of skin, by union of certain muscles, such as those of the abdomen, or by a direct union of the two peritoneal cavities so that a free communication is permanently established between them. A few comparable parabiotic human twins are known in medical literature.

A fundamental point to be established before animals in parabiosis can be satisfactorily employed for the investigation of biologic, pathologic or clinical problems concerns the extent to which, if at all, there is any interchange of blood and humors between the bodies of the two partners which have grown together. Obviously if their relationship is solely one of contiguity, little physiologic influence could be expected to be exerted on one organism through procedures directed toward its partner. The question as to whether vascular anastomoses actually become established between the parabiotic partners has been much debated. The consensus of evidence points to the possibility, although one would scarcely expect larger blood-vessels to be developed between the two individuals in any event. That communication can be established through lymph-channels is more than likely; and when the peritoneal cavities are directly connected, an open path for the transference of fluids from one organism to the other is inevitable. In any case the processes of diffusion are possible between the conjoined tissues.

Experiments in successful cases of parabiosis have shown that foreign compounds, such as iodids or bromids, introduced into one of the united individuals, are excreted by the partner, leaving no chance to doubt that a humoral exchange is developed. The great difficulties which attend the successful production of lasting parabiosis have raised the inquiry as to whether an exchange between the proteins of the two individuals does not lead to a degree of hypersensitiveness which is most unfavorable to the health of one or both of the partners. The phenomena of anaphylaxis suggest themselves at once.

1. For the literature on this subject consult Heyde, M.: Ueber die Parabiose, Ergebn. d. Physiol., 1912, xii, 564.

By a study of parabiotic animals it has been hoped to solve some of the vexed questions of internal secretion, the compensatory action of organs, the kidney functions and the production of edema. Extirpation of the kidneys of one partner has been followed by a compensatory hypertrophy of the renal organs of the other. The vicarious action of one set of kidneys, as a rule, sooner or later fails; for the nephrectomized individual usually shows symptoms of decline in due course of time. This fact, among others, has led anew to the suggestion that the failure is attributable not to any deficiency in the elimination of tissue waste, i. e., urinary products, but rather to the lack of an internal secretion of the kidney essential for nutritive equilibrium. We are not prepared at present to defend the theory of an internal secretion of the kidney. The illustration cited is intended to exemplify the type of problem for which parabiosis has furnished a mode of attack.

In pancreatic diabetes evidence for the existence of a circulating internal secretory product has been sought by recourse to parabiosis. When the pancreas is extirpated from one partner, the sound individual can apparently delay the onset of the diabetes in the companion operated on or modify its severity to some degree. The influence of the presence or absence of the sexual glands on the development of secondary sexual characters has been drawn into the scope of the inquiries associated with parabiosis. Likewise the intimate interrelation of healthy and infected organisms has been called on to throw light on the mechanism of immunity. It is too early to report progress in any of these fields of application, but a new method of research usually justifies the promise of new light on the subject.

THE NEW SALVARSAN

There has always been more or less inconvenience connected with the administration of salvarsan. It has to be dissolved and the solution neutralized immediately before its use, a somewhat difficult procedure for the ordinary physician. The manufacturers have now introduced a new product — neosalvarsan — which they describe as being practically identical with salvarsan in its effects, but which dissolves in water to form a neutral solution and which can therefore be injected directly without further manipulation. Neosalvarsan, like its predecessor, is a patented product, so that the duration of proprietary control of Ehrlich's discovery is extended a year or so to the commercial advantage of the promoters, as usual. In this new preparation the basis of salvarsan (3-diamino-4-dihydroxy-1-arseno-benzene) is not combined with hydrochloric acid to form the hydrochlorid, but with the radical of sodium formaldehydsulphoxylate or sodium methanalsulphoxylate ($(CH_2O)OSNa$, to yield the compound present in neosalvarsan. Approximately two parts of this modified salvarsan (sodium-3-diamino-4-dihydroxy-1-arseno-benzene-methanalsulphoxylate, $NH_2.OH.C_6H_3.As:As.C_6H_3.OH.NH(CH_2O)OSNa$), mixed with one part of inert material constitute the preparation now on the market under the name of neosalvarsan.

Sodium formaldehydsulphoxylate is an interesting chemical compound. It was discovered in 1906 by Bernthsen, head chemist of the Baden Anilin and Soda Works, formerly professor of chemistry at Heidelberg. Asserting that the product was of value in etching colored textiles and as a reducing agent in calico printing with indigo, the Baden Anilin and Soda Works secured a patent on a process for making this product; and about six months later the Farbwerke vorm. Meister Lucius und Brüning — the firm which makes salvarsan — patented a different process for making the same substance. This is a good example of the process-patent — the German method of protecting new discoveries.

Bernthsen believes that this is a salt of formaldehydsulphoxylic acid; he assumes that the latter is a condensation product of formaldehyd, CH_2O, and an acid, H_2SO_2, which appears to be the hyposulphurous acid formerly discussed in chemistries as theoretically possible. As Bernthsen believes this acid to possess the structure H-S-O-H, he calls it sulphoxylic acid to show the relation of its radical -S-O-H to the carboxylic group -C-O-H, commonly found in organic acids, sulphur having taken the place of carbon.

Not only is the composition of neosalvarsan most interesting, but also its evolution illustrates the advantages possessed by large factories, for here it has been found possible to utilize the chemical introduced as an aid in calico printing to convert the patented chemical salvarsan into a new body, in which not only the new body but also the substances used to make it are protected by patent. Naturally if neosalvarsan proves equal to salvarsan without the drawbacks of the latter, it will come into general use in place of salvarsan, and the additional patent will keep its manufacture in the control of the makers more securely than in the case of salvarsan.

THE PRESENT POSITION OF SALVARSAN IN SYPHILIS

The various papers and discussions on salvarsan therapy which appear in this number of THE JOURNAL call attention to the shifting position of that debated remedy. The fact is evident from current literature that salvarsan has not lived up to the early promises for it for it does "not effect a complete cure of syphilis in the sense Ehrlich anticipated." Enthusiastic advocates report cures in a certain number of early cases based on negative Wassermann findings over periods ranging up to two years; but clinical and serologic results alike prove that the remedy can no more be credited with definite cure in routine cases of syphilis than can mercury. As Dr. Howard Fox says, "It would be possible for a prejudiced observer to prove his case in favor of either mercury or salvarsan." The most incontrovertible evidence of the

incompleteness of the action of salvarsan is the fact that mercury is now universally called in to its aid. In view of the early sensation caused by salvarsan and the condition even now of the lay and to a great extent of the professional mind in regard to it, the most important thing to hold to at present is that, as a general fact, salvarsan does not cure syphilis. To rely on it to do so is to court disaster. If the practitioner uses salvarsan, he should combine with it established measures of treatment, and patients should still be treated in the way which long experience has shown to be of most benefit.

Of the value of salvarsan as a symptomatic remedy in syphilis there is unanimity of opinion. It causes syphilitic lesions to disappear, some with great rapidity, others less rapidly. Indeed, its effect on many syphilitic lesions is so definite that there would be no doubt of its permanent addition to the routine means of treatment of syphilis were it not for the uncertainty as to its dangers, for it is of the dangers of salvarsan that we know least. This we do know: its use is not free from grave accidents, especially to the nervous system, and from occasional deaths. It is quite probable that serious results, particularly deaths following the intravenous injection of salvarsan, are much more frequent than would be inferred from the literature, even with the innumerable accidents which are recorded. Thus, in the discussion of the papers in the symposium on salvarsan published in this issue, four cases of encephalitis occurring in the knowledge of one man within twelve months and one case of optic atrophy following salvarsan were cited. Ehrlich and his school have exercised great ingenuity in explaining away many of these accidents; in fact, to account for large groups of them the whole past study of syphilis has been indicted as incompetent and the statement made that these sequelæ are part of syphilis, hitherto unrecognized or usually overlooked. Nevertheless the serious accidents from salvarsan cannot be overlooked. The dangers from its use, however, would be as nothing if it cured syphilis; no one, for example, questions the obligation to use anesthetics, even if an occasional death occurs from them.

In the final analysis of the question of salvarsan therapy at present we are brought down to the following situation: It cannot justly be said that salvarsan cures syphilis any more than it can be said that mercury cures syphilis. That being the case, is it of sufficient value in syphilis to overbalance its untoward effects? In certain conditions there can be no doubt that it is of much value; but whether this will prove true of its use as a routine remedy in syphilis will not be established until we become familiar with its dangers, both immediate and remote.

PATHOGENIC YEASTS

Biologically a rather close relationship exists between yeasts and bacteria. The action of certain yeasts in brewing, bread-making and various other fermentative processes is so commonplace an occurrence that it is too often forgotten that, as in the case of bacteria, the processes which are beneficial and harmless under some conditions may become virulent and destructive under others. Since Gilchrist first described yeast-like organisms in sections from a skin lesion in 1894, it has been known that certain yeasts could become pathogenic for man. A considerable literature has grown up describing lesions produced by yeasts on skin and mucous membranes. American observers have been foremost in this work, and of these Ricketts, Hektoen, Ormsby, Hyde, Montgomery and Pusey deserve special mention.

The clinical picture of dermal and mucosal yeast infections, variously named blastomycosis, oidiomycosis, saccharomycosis, or best, simply mycosis, is fairly constant, although at least four distinct types of yeast fungi have been found. Apparently the clinical picture is the same for all four types and for the numerous transition forms between them. The infection typically pursues a chronic course, rarely tending toward spontaneous healing, and produces little or no constitutional or lymphatic reaction. The skin lesions may ulcerate or subcutaneous abscesses and tubercles may form. Any part of the body may be affected. A septic condition with invasion of the circulation and wide metastasis may occur and be fatal, even with no skin lesions. In 1908 Montgomery and Ormsby[1] reported a considerable number of cases of systemic blastomycosis. In their experience the systemic affection was serious and offered a grave prognosis. They found, however, that with early diagnosis it was often possible to arrest and cure the condition with potassium iodid, tonics and hygienic control, possibly including change of climate. Mycosis is more commonly seen in the tropics, where it is apt to be mistaken for tinea or atypical frambesia. In temperate climates it is more easily confused with tuberculous nodules, syphilids or epithelioma. The most successful treatment has been by the use of disinfectants and the Roentgen ray locally, and the administration of potassium iodid internally.

A recent paper by Dr. Lorena M. Breed[2] presents some interesting clinical cases of yeast infection, and calls attention to the possible significance of yeast organisms in the sputa in doubtful lung cases. Dr. Breed reports sixteen cases of anomalous and indeterminate lung conditions in which repeated examination failed to show tubercle bacilli, and in which a yeast infection was demonstrated morphologically and by culture. One case of a resistant vaginal discharge in a child was due to a yeast. One patient with typhoid fever died after two months' illness, and cultures from the feces showed, in addition to typhoid bacilli, a yeast organism similar to the one identified in the other cases. One patient with a diphtheroid tonsillar membrane showed no Klebs-Loeffler bacilli but a pure yeast culture, and did not react to diphtheria antitoxin. One patient, with a history of ulcers on various parts of the body for eight

1. Montgomery and Ormsby: Systemic Blastomycosis, Arch. Int. Med., August, 1908, p. 1.
2. Breed, Lorena M.: Clinical and Experimental Observations with a Saccharomycete, Arch. Int. Med., August, 1912, p. 108.

months, showed yeast organisms in the pus. The same yeast, a saccharomycete, was identified in all these cases, usually mixed with other organisms. In a few cases, disappearance of the organism was definitely followed by alleviation and disappearance of the symptoms. Autogenous vaccines from this yeast gave some improvement in three cases, and exacerbated the condition in one. An extract from it gave a mild skin reaction in two of the cases. In four cases the blood-serum gave a positive agglutination test for the yeast. In treatment, large doses of potassium iodid gave most benefit. Dr. Breed's observation on the possible relation of pathogenic yeasts to anomalous lung conditions in which no tubercle bacilli can be found, opens an interesting field. Further investigation is necessary of persistent and obscure cases of bronchitis, asthma, atypical pulmonary tuberculosis, atypical lobar pneumonia, and extreme susceptibility to coryza and sore-throat in which other causative agents cannot be found. It would also be desirable to have exact clinical descriptions of such cases, and whenever possible, complete post-mortem findings.

Current Comment

POISONING FROM COMMON SALT

A case reported in this issue[1] calls attention to the well-known yet not always sufficiently recognized fact that sodium chlorid, while the least toxic of the group of similar metal chlorids, is a poison which may be abused with fatal results. So far as we can learn, the only parallel in literature to this case is that reported by Brooks,[2] in which a strong stock solution of sodium chlorid, carelessly substituted for physiologic solution in the enema ordered after an appendicitis operation, produced, as in Campbell's case, thirst, fever, purging, convulsion and death. In Brooks' case the patient received about 9 ounces of sodium chlorid. While the amount of salt which was supposed to have been administered in a quart of water to Campbell's patient was even larger (a pound), it may be noted that in all probability the patient received less than 5 or 6 ounces, since, unless the solution was prepared long before use, it had not become fully saturated. Although accidents such as those which resulted in these two deaths may be rare, the lesson which they enforce is of almost daily practical importance, since they emphasize the harm that may be done by the indiscriminate use of salt solution. Evans[3] reports two cases in which the postoperative use of physiologic saline solution resulted fatally. It is possible that, as indicated by Evans, mortality records from "shock," "hemorrhage" and other postoperative complications may be raised by the use of carelessly prepared solutions which are not isotonic with the blood-plasma, or even by thoughtless use of the correct solution in conditions for which it is not adapted. Evans, Trout,[4] Wood[5] and others agree in recommending caution. Wood says that its employment in toxemic cases with the idea of hastening elimination is based on an erroneous conception. Evans especially condemns the use of physiologic saline solution in "toxemia due to acute infections accompanied by marked diminution or absence of chlorid excretion, even though the functional capacity of the kidney is unimpaired," as for instance, in lobar pneumonia.

1. Campbell, O. H.: A Peculiar Case of Common Salt Poisoning, p. 1290.
2. Brooks, Harlow: A Case of Fatal Sodium Chlorid Poisoning, Arch. Int. Med., November, 1910, p. 577.
3. Evans, George H.: The Abuse of Normal Salt Solution, THE JOURNAL A. M. A., Dec. 30, 1911, p. 2126

THE HYGIENE CONGRESS

The Fifteenth International Congress on Hygiene and Demography, held last week in Washington, was, as predicted, a notable event in the history of public health in our nation. Not only on account of the large number and high scientific character of those in attendance, but also on account of the interest manifested by the public and the amount of space devoted to its proceedings by the daily press, this congress must be regarded as one of the most successful and influential ever held in this country. The opening session, an account of which has already appeared in THE JOURNAL,[1] was impressive and inspiring. The presence on the platform of official representatives of twenty-three nations gave promise of greater international cooperation for the advancement of public health. The sections were well attended and the programs in the great majority of cases were thoroughly creditable. While some of the difficulties necessarily attendant on international gatherings were apparent, the week's program was in every way worthy of the time and effort required and should have been attended by every state or municipal health officer, as well as by all those interested in the advancing public health campaign. The health exhibit was particularly creditable. Those who had the opportunity of seeing it must have appreciated the immense amount of time, thought and labor that was necessary to bring it to a successful completion. It was vast in extent and almost bewildering in variety, yet of enormous educational value. In spite of a few criticisms, unavoidable in an undertaking of this magnitude, the exhibition was a marked success, the credit for which belongs to the director, Dr. J. W. Schereschewsky. For the first time in such an exhibit the material was classified. Instead of being arranged according to geographical location or by the character of the organizations making the exhibits, the material was divided into thirteen classes. These were: Food, Infant Hygiene, Child Hygiene, School Hygiene, Oral Hygiene, Physical Education, Hospitals and Communicable Diseases, Housing, Industrial Hygiene, Sewage Disposal and Water-Supply, Sex Hygiene, Mental Hygiene and Vital Statistics. This plan produced a unity impossible under the older and more haphazard methods. The congress was a success in every sense and the United States will profit enormously by the impetus which it will give to interest in public health problems.

4. Trout, Hugh H.: Proctoclysis; Some Clinical and Experimental Observations, THE JOURNAL A. M. A., May 4, p. 1352.
5. Wood, H. C.: Therapeutic Value of Physiologic Salt Solution, THE JOURNAL A. M. A., April 17, 1909, p. 1277.
1. THE JOURNAL A. M. A., September 28, p. 1207.

THE HYGIENIC EXHIBIT AND ITS LESSONS

The hygienic exhibit made in connection with the International Congress on Hygiene and Demography at Washington was one of unusual interest and suggestiveness to the thoughtful observer. Probably never before has it been made so apparent that the control and suppression of preventable diseases is becoming more and more a social rather than a scientific problem. In former generations, the relations between physician and patient were almost entirely individual. Only with the development of modern medicine has either the individual physician or the combined profession attained a distinct social function and responsibility. In former generations, owing to meager knowledge of diseases and their causes, the social responsibility for a large share of humanity's ills was not recognized. To-day, as soon as science discovers the cause of a disease, its method of transmission and the means for its prevention, the disease ceases to be a problem from a scientific point of view. It then becomes an additional social responsibility, since, in the majority of cases, our recently acquired knowledge shows that preventable diseases exist largely because of social sins, and that their prevention involves the reformation of some long-standing evil. As illustrations of this general principle it is only necessary to point out that any one of several neglected factors — a polluted water-supply, a filthy milk-supply or an inadequate system of garbage-disposal — may be responsible for a prevalence of typhoid fever in any civilized community; that tuberculosis thrives where insanitary tenements, factories and workshops are permitted; that typhus fever is found where large numbers of persons are crowded together under insanitary conditions; that yellow fever is the price paid for stagnant mosquito-breeding waters, and that the removal of all these causes, as soon as they become clearly evident, is a duty of society and not of the medical profession alone. This fact, clearly realized, is a sufficient answer to the question, repeatedly and often insincerely asked: "If physicians know how to save 600,000 lives a year in this country, why do they not go ahead and save them, without waiting for a national department of health?" The reply is obvious. Scientific men can discover causes and devise methods of prevention. Only the people themselves can save themselves from the results of their own sanitary sins or ignorance. Such graphic presentations of our present knowledge regarding disease and its causes as the exhibit displayed in Washington are of the greatest value as public educators.

THE PSYCHOLOGY OF HEALTH EXHIBITS

When going through the hygienic exhibit at Washington, the careful observer must have been repeatedly impressed with the lack of consideration shown by some exhibitors for the fundamental principles of psychology and pedagogy. In several instances, in a desire to economize space or to increase the material in the exhibit, placards or diagrams containing many details were placed high above the eye of the reader, or so low down as to make considerable stooping necessary to read them. Only the occasional visitor, one who is already interested in the subject of the exhibit and familiar with it, will take the necessary time and pains to examine carefully exhibits which lie above or below the ordinary line of vision. Another mistake, in a few instances, was over-elaboration of exhibits. A national organization, for example, which is doing excellent work in the field of sex hygiene, presented one of the largest exhibits to be found in the hall; yet the very elaborateness of this exhibit, to a certain extent, defeated its own purpose. The great number of charts and diagrams, presenting almost every possible phase of the sex hygiene problem, tired and bewildered even the trained observer, while to the layman it must have presented a veritable maze of information, without any of the essential features being made to stand out from the background. In preparing any exhibit for the public, a few essentials should be kept clearly in mind. Each card or exhibit should teach some one important and essential fact; it should be as impossible for the visitor to depart without this fact being impressed on his mind as it is for a passenger to escape from a street-car without an impression of the incomparable merits of Smiles' Sunshine Shaving Soap or Blithers' Boston Baked Beans. This means that complicated diagrams, charts with large amounts of fine figures or lettering, exhibits in which an attempt is made to combine several unassociated facts, are much less valuable for educational purposes than simple, plain, easily understood charts or diagrams. A study of the methods of modern advertising would be of benefit in preparing these exhibits. The advertising specialist has learned that the ordinary reader or observer will grasp no more than a certain amount of new material at a time. He consequently aims, through a few carefully selected words or phrases, to impress one fact at a time on the mind of the reader, leading him gradually from a familiar fact to a new statement by short but certain steps. In order to succeed in our efforts to educate the public on health matters, we must recognize and observe some of these fundamental psychologic principles.

PUBLIC EDUCATION A DUTY AND A RESPONSIBILITY

The education of the people on public health matters is not only a responsibility but also an unavoidable duty. The people are interested in public health questions to-day as never before. They want knowledge and they are going to have it. If the medical profession does not give it to them, they will procure it elsewhere as best they can. The duty and necessity of professional activity in this direction have been generally recognized. It must also be recognized that the assumption on our part of this responsibility carries with it an obligation to abstain, both individually and collectively, from anything which may impair our usefulness in this particular. It is of the first importance that the public, if it is to look to us for instruction on health matters, must be able to place reliance in any statements we make, either as individuals or as organizations. For this reason, the utmost care should be exercised as to the accuracy of all exhibits and statements made for the public's use. Exaggerations or unwarranted assumptions should be avoided carefully. The place for the discussion of theories, unproved hypotheses, evidence of doubtful value

and general statements lacking positive proof to support them is in professional circles and before scientific audiences. Only those facts which are proved beyond question, those theories which have been tested in every possible way, and those opinions which have been accepted by the majority of scientific men have any place in public exhibits or demonstrations. Exaggerated statements, deductions based on incomplete evidence and favorite theories or pet hobbies of one person or another are out of place in such exhibits. The mass of the people, however interested they may be in health topics, have not the necessary training or knowledge of scientific data to enable them to distinguish between demonstration and assumption in scientific matters. We can best secure the confidence of the people by using the utmost caution and conservatism in presenting scientific truths, and by avoiding overstatement, exaggeration, inaccuracy or unwarranted enthusiasm in any material which is placed before them.

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LOUISIANA'S GOOD WORK

It is a commendable thing to clean up a whole state. It is still better by so doing to set a shining example whose rays extend to the uttermost parts. Such an example is furnished by the work of the energetic head of the Louisiana State Board of Health and his able assistants, an engaging and interesting account of which is given in that terrifying stirrer-up of the animals, *Collier's Weekly*.[1] The thorough and intensely practical work in sanitation in Louisiana has been good for that state. The evangelistic work done by Dowling in taking his health train from coast to coast has been good for the whole country. The best effect of the sanitary work done by the State Board of Health in Louisiana has been the educational effect. It was a brilliant conception to spread the gospel of health in the manner in which it has been done and it has benefited all of us. Education in everyday sanitation is the need of the hour throughout the length and breadth of the land. A work that is strong enough to attract the attention and enlist the support of *Collier's* deserves the reenforcement which its exploitation by that publication will furnish.

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A NEW PUBLICITY LAW

A law is now in effect requiring all newspapers to publish, twice a year, a sworn statement giving the names of their owners and chief stockholders. It also requires them to label as advertisements all editorial and news matter for which they receive pay. Needless to say some newspaper publishers are going to fight this law in the courts. They hold that it is unconstitutional. It is always unconstitutional to require large vested interests to give to the public unpleasant facts regarding their inner workings! The new law interests physicians as it will tend to do away with one gross abuse against the public health. No longer will such papers as *Leslie's Weekly*, for instance, be able to publish "special articles" praising such frauds as the Viavi "treatment" or eye-quack Oren Oneal without letting their readers know whether or not such stuff is paid for. No longer will the newspapers be able to print as departmental matter "Health and Beauty Hints" in which recommendations for nostrums of the "prescription-fake" type are skilfully concealed. No longer will canned editorials sent out by the Proprietary Association of America be acceptable "copy" to those newspapers whose income is largely derived from advertising "patent medicines." Altogether the law is a good one, to which no reputable newspaper need object. The only criticism we would make of it is that it is not sufficiently inclusive. Scientific periodicals are exempt from its requirements. This is a pity. We should particularly like to see the law made applicable to medical journalism. Not only would it be most interesting to learn the sources from which the financial support of many medical journals is derived, but it would be enlightening to see the "reading notices" and many "original articles" with the tell-tale suffix "[Adv.]." We trust that the time will come when the new law will be so extended as to take in scientific periodicals as well as newspapers. Such an extension would do much to eliminate the "underground work" of the manufacturers of "ethical proprietaries."

1. Child, Richard Washburn: Collier's Weekly, Sept. 28, 1912.

Medical News

ARKANSAS

New Officers.—Pulaski County Medical Society (colored) at Little Rock; president, Dr. J. Thornton; secretary-treasurer, Dr. J. O. Hickman, both of Little Rock.

Personal.—Dr. Theodore Freedman, Argenta, local surgeon for the Iron Mountain System, is ill with gastritis in St. Vincent's Infirmary, Little Rock.——Dr. Leonard R. Ellis, Hot Springs, has been elected surgeon general of the United Spanish War Veterans.

New Infirmary at State Hospital.—The building originally erected as a dairy barn on the ground of the State Hospital for Nervous Diseases, Little Rock, has been converted into a model infirmary for the use of infirm white women. The building has been remodeled along sanitary lines and has been completely equipped and will accommodate one hundred and fifty-two patients and the nurses required for their care.

Colored Physicians of State Meet.—The Arkansas Medical Association (colored) held its annual meeting in Little Rock, September 17-19 and elected the following officers: president, Dr. J. G. Thornton, Little Rock; vice-presidents, Drs. J. S. House, Sherrell, and R. Q. Canfield, Little Rock; corresponding secretary, Dr. A. A. Womack, Little Rock, and treasurer, Dr. D. L. Williams, Forrest City. Hot Springs was selected as the next place of meeting.

Railway Surgeons Organize.—The Arkansas Association of the St. Louis, Iron Mountain and Southern Railway Surgeons met for organization at Little Rock, September 17. Dr. W. F. Smith was elected temporary chairman and Dr. M. E. McGaskill, Little Rock, temporary secretary. Drs. W. B. Lawrence, Batesville; J. S. Eastland, Judsonia, and W. H. Abington, Beebe, were appointed a committee to draw up a constitution and by-laws, and Dr. C. S. Holt, Fort Smith; Robt. Lee Smith, Oklahoma, and Dr. F. L. Watson, Little Rock, were appointed a committee to nominate officers for the permanent organization.

CALIFORNIA

Lepers Attempt to Escape.—Health Officer Dr. R. G. Brodrick has requested the supervisors of San Francisco County to direct that the fences around the leper division of the isolation hospital be raised high enough to prevent the inmates from climbing out and escaping.

Health Department to be Reorganized.—Sweeping changes in the organization of the Oakland Health Department are proposed by Commissioner F. C. Turner of the Department of Public Health and Safety. The chief feature of the plan is the establishment of the office of health director with a salary of from $3,000 to $3,600 a year. The health director will be under civil service regulations and will be expected to devote

his entire time to the work. A centralized force is also provided which will attend to the clerical work of all branches of the department. The new system, it is estimated, will cost only $1,500 a year more than the system at present in force.

Hospital Notes.—The third annual report of the Red Cross Hospital, San Mateo, gives the detailed plans for the immediate construction of a building, south of the present hospital building, to be erected at a cost of $100,000. The new building will contain three stories and a basement. On the first floor will be offices, waiting-rooms and laboratories and four wards. On the second floor there will be private rooms with baths and a solarium. The third floor will be devoted entirely to operating-rooms.——The Westlake Hospital is planned to be erected in Los Angeles at a cost of $200,000. The first wing, which is at present under construction, will be four floors in height and eighty-four by thirty-six feet, of brick, fireproof construction and will contain twenty-two rooms for patients. Dr. O. C. Welbourn is president of the corporation and Dr. C. H. Erwin secretary.——Plans for the projected Methodist Hospital of Southern California on South Hope Street between Twenty-Eighth and Twenty-Ninth Streets, Los Angeles, have been completed. The institution will be of reinforced concrete construction and fireproof. The completed project will represent an outlay of more than $250,000. The building will be five stories in height in the shape of the letter "H" and will consist of an administration building, 100 by 42 feet, and two flanking buildings, each 150 by 36 feet.

CONNECTICUT

Gift to Medical School.—Yale Medical School has recently received $25,000 from the estate of Cyprian S. Brainerd of Haddam, Conn. It is stated also that subsequently the school will receive $40,000 in addition on the death of the life beneficiary.

Personal.—Dr. William J. Shehan, Jr., New Haven, has been appointed a member of the resident staff of Providence Hospital, Detroit.——Dr. Dupue, a member of the staff of the Norwich Hospital, is reported to be ill in Binghamton, N. Y. ——Dr. and Mrs. William C. Wile, Danbury, celebrated their silver wedding anniversary August 31.——Dr. F. D. Ruland, Westport, is reported to be seriously ill with appendicitis, and is under treatment in a New York hospital.——Dr. J. Hobart Egbert, Willimantic, formerly city physician, is traveling in Nicaragua.

GEORGIA

New Officers.—First District Medical Society at Savannah: president, Dr. J. L. Jackson; secretary-treasurer, Dr. Charles Usher, both of Savannah. The session concluded with a banquet at Tybee Island.

New Health Publications.—The Brunswick Board of Health has decided to issue a monthly bulletin to be devoted entirely to health matters of the city to instruct the people regarding the benefits to be derived from observing health regulations.

Personal.—Dr. and Mrs. W. S. Elkin, Atlanta, have returned from Europe.——Dr. J. L. Walker, Waycross, has been appointed a member of the State Board of Health.——Dr. James C. Oakshette, Atlanta, has been appointed health officer of Fulton County.——Dr. John Wade Chambliss, Americus, fractured his right arm while cranking his automobile, September 18.

ILLINOIS

Staff Examinations for State Institutions.—Examinations will be held at the Elgin State Hospital, October 12, for various state charitable institutions.

Sanatorium Planned for Bellville.—An ordinance has been submitted to the Council of Bellville providing for the conversion into a tuberculosis sanatorium of the present city hospital which is located on a tract of fourteen acres, three miles south of the city and on the highest point in St. Clair County.

Personal.—Dr. Flint Bondurant, Cairo, was severely injured in an automobile accident, near Mound City, September 23, and is under treatment in the Bondurant Hospital.——Dr. William L. Ballenger, Chicago, who received an injury to his foot while returning from England a few weeks ago, has recovered.——Dr. John M. Lang has been appointed an instructor in clinical gynecology at the Illinois Post-Graduate Medical School, Chicago.

Chicago

Information Regarding Anterior Poliomyelitis.—The Department of Health of Chicago has issued for distribution to physicians and others interested a leaflet on anterior poliomyelitis or infantile paralysis, outlining the safeguards against the spreading of the disease.

Entertainment of European Visitors.—The first part of this week the medical profession of Chicago has been entertaining the group of physicians who are making a tour of the United States under the auspices of the German Central Committee for Physicians' Study Travels. The names of the members of the party were given in General News in THE JOURNAL, August 31, their itinerary was outlined August 24, and the history and objects of the organization were sketched September 7. Their visits to New York and Philadelphia have been chronicled. From Chicago they go to New York via Niagara Falls, Montreal and Boston. They have been kept busy in Chicago with clinics, visits to hospitals and public buildings, a trip through the famous stock yards, automobile drives about the parks and boulevards, and various social functions including a Kommers and a banquet.

KANSAS

Sanatorium Site Selected.—The Advisory Commission appointed to select a site for the State Sanatorium for Tuberculosis, has reported its approval of a tract of 240 acres, two and one-half miles west of Newton. The last legislature appropriated $50,000 for the sanatorium.

Personal.—Dr. A. H. Fabrique was given a banquet in honor of his seventy-seventh birthday anniversary at the Wichita Club, September 9.——Dr. W. J. Murphy, National Military Home, has resigned as surgeon of the Soldiers' Home, Leavenworth.——Dr. S. C. Emley, Kansas City, who was recently operated on at Rochester, Minn., is reported to be making progress toward recovery.——Dr. W. E. Dixon, Derby, is reported to be seriously ill with septicemia due to an operation wound.——Dr. H. W. Horn, Wichita, has been appointed chief surgeon of the Kansas City, Mexico and Orient Railway. ——Dr. P. W. Darrah, Leavenworth, has been appointed local surgeon for the Missouri Pacific System.——Dr. George R. Little, Wichita, has been appointed city physician, vice Dr. Lloyd P. Warren, resigned, who has started for Europe.—— Dr. R. Claude Young, Arkansas City, is ill with an infected wound of the ankle.

MARYLAND

Action Taken to Check Typhoid.—The State Board of Health has taken action to check the typhoid outbreak at Towson, the county-seat of Baltimore County, by closing wells and dairies, etc., as there were thirty-six cases in the town.

To Inspect Sanitary Conditions.—A committee of the Baltimore County Medical Society has been appointed to inspect the sanitary conditions of its towns and report to the State Board of Health. The committee consists of Dr. Marshall B. West, sanitary officer of Catonsville, Drs. Henry Naylor, Pikesville, and Hugh Young, Baltimore.

Baltimore

Personal.—Dr. Adolph Meyer gave a dinner, September 28, in honor of Dr. von Fraenkel of Vienna, one of the guests of the hygiene congress.

Remsen to Remain at Hopkins.—Owing to the difficulty of finding a suitable occupant for the post, Dr. Ira Remsen will remain at the head of the Johns Hopkins University for the ensuing session, or part of it at least.

Hospital Notes.—Plans for the Charles L. Marlburg Memorial Building at the Johns Hopkins Hospital have been completed. The original fund of $100,000 contributed by the heirs of Mr. Marlburg in 1907 has been added to by one of them, Mr. William A. Marlburg. This building, which is for private patients, will be four stories in height and will contain fifty-four private rooms and twenty baths.——At the meeting of the trustees of the South Baltimore Eye, Ear and Throat Hospital, September 26, $2,000 were subscribed by them toward the building fund, making $125,000 in all. When $200,000 is raised the work of the building will begin.

MISSOURI

Hygiene Exhibit at State Fair.—The exhibit on hygiene and sanitation, to which THE JOURNAL recently referred, was one of the features at the state fair at Sedalia. The exhibit was under the auspices of the Missouri State Medical Association and was in charge of Dr. E. J. Goodwin, St. Louis, secretary of the association. The exhibit was a notable success in spreading knowledge among the people regarding the methods of safeguarding health.

Personal.—Dr. David H. Bokhof has resigned as head resident of the Thomas H. Swope Settlement, Kansas City.——

Dr. and Mrs. Flavel B. Tiffany, Kansas City, sailed from New York, September 18, on a trip around the world.——Dr. Horace H. St. John, Edina, was attacked by two vicious bulldogs, September 7, and severely injured.——Dr. R. E. Castelaw has succeeded Dr. L. W. Luscher as superintendent of the Kansas City General Hospital.

St. Louis

New Isolation Hospital Located.—Despite the opposition of residents of the vicinity, it has been decided to erect the new Municipal Isolation Hospital on Arsenal Street, between the city sanatorium and the city infirmary.

Personal.—Dr. Victor A. Bles has been appointed assistant physician and assigned to duty at the Elgin (Ill.) State Hospital.——Dr. Senter Gettys was struck by an automobile, September 1, and sustained painful injuries.

Masonic Infirmary Dedicated.—The new Masonic Infirmary on the grounds of the Masonic Home of Missouri was dedicated with formal ceremonies, September 24. The building has been erected at a cost of $125,000 and is a hospital intended for the care of sick and afflicted Masons. It will have accommodation for 140 patients.

MONTANA

Donation to Sanatorium.—A donation of $25,000 toward the State Tuberculosis Sanatorium, Warm Springs, has been made by the Anaconda Mining Company.

Sanatorium Contract Awarded.—The State Board of Examiners has awarded the contract for the buildings of the State Tuberculosis Sanatorium near Warm Springs to a Butte construction company for $25,467.

Personal.—Drs. Patrick H. O'Malley and Clarence J. Latta, Chinook, have leased a large house in the business district and will equip it as a private hospital.——Drs. J. W. and R. R. Frizzell, Great Falls, have made an automobile journey from Wooster, Ohio.——Dr. C. B. Miller, Helena, has moved to his ranch in Flathead County.

NEW JERSEY

Health Department Erects Building.—A permit has been granted by the Newark Building Department to the Department of Health to erect a four-story office building, to cost $85,000.

Diphtheria in Camden.—Because of fifty cases of diphtheria and three deaths from that disease, several public schools, a public library and a number of Sunday schools in the east section of Camden have been closed until the disease is under control. The City Council appropriated $1,000, September 26, to fight the epidemic. It is the belief that the source of the disease is in the very insanitary condition of this section.

Physician Nominees.—Dr. Hyman I. Goldstein, Camden, candidate for member of the board of education; Dr. John K. Bennett, candidate for mayor of Gloucester; Drs. William H. Kensinger, Walter S. Bray and Sylas Quint, candidates for membership in the city council of Camden; Dr. E. B. Rogers, candidate for state assemblyman; Dr. Duncan Blake, Jr., Camden, candidate for surrogate of Camden County.

Personal.—Dr. J. Henry Clark, Newark, has returned after a three-months' trip abroad.——Dr. Alexander McAlister, Camden, has been appointed a member of the State Board of Medical Examiners.——Dr. G. A. Schoening, Trenton, is a patient at the German Hospital, Philadelphia.——Dr. John B. McGill, Jersey City, is ill at his home.——Dr. James Betts, Camden, was seriously injured while cranking his automobile, recently.

NEW YORK

Medical Reserve Planned.—Bills have been prepared for presentation at the next legislature providing for the creation of the office of surgeon-general and the organization of a medical reserve in the national guard. It is reported that Governor Dix has expressed his approval of a medical reserve similar in organization to that of the regular Army.

New York City

Medical College Opens.—The College of Physicians and Surgeons of Columbia University was opened on September 25 by Dr. Nicholas Murray Butler. Dr. Theodore C. Janeway spoke on "The Importance of Pathologic Theory for Practical Medicine."

Oysters Fattened in Polluted Water.—The investigation by the board of health into the cause of certain cases of typhoid has confirmed the suspicion that the oysters were contaminated by being fattened in polluted water. In consequence of this the board of health issued an order prohibiting this procedure and the sale of oysters that have been so fattened.

More Street-Car Accidents.—The number of street-car accidents, according to the report of the Public Service Commission, occurring during the month of August was 6,528 as compared with 5,884 and 5,195, respectively, for the corresponding months of 1911 and 1910. The number of deaths caused by the accidents was, however, smaller than in August, 1910, and but three more than in August, 1911.

To Check Opium Smoking.—Judge Hough of the United States District Court, in sentencing Frank R. Cooper to six months' imprisonment and a fine of $250 for selling opium, expressed his determination to do his utmost to suppress opium smoking. He said that only about 70,000 pounds was annually imported for medical purposes while he was satisfied that the illicit importation amounted to 250,000 pounds a year.

Lack of Nurses at Bellevue.—The results of an investigation made by a committee of four of the nursing staff of Bellevue Hospital disclose the fact that of 357 nurses only about 200 are actually in attendance on the sick, the remainder being engaged in clerical duties. In the entire institution, which has accommodations for 1,300 patients, there are only 130 nurses on duty in the daytime. At night, seventy nurses are on duty in all the wards.

Personal.—Dr. S. S. Goldwater, superintendent of Mount Sinai Hospital, and municipal expert in hospital construction in the Department of Bellevue and Allied Hospitals, has been appointed by the Association for Improving the Condition of the Poor to supervise the construction of the new Seaside Hospital for the treatment of children suffering from tuberculosis of bones and joints. On the completion of the hospital it will become the property of the city of New York.——Dr. Albert H. Brundage has returned to Brooklyn completely restored to health and has resumed practice.——Dr. Alwyn Knauer of the Psychiatrische Klinik, Munich, Germany, who has been one of the lecturers at the extension course which has been in progress at Fordham University, has been engaged to remain in this country and conduct a course of experimental medicine at the university.——Dr. and Mrs. A. S. Corwin and Dr. Ward I. Pierce have sailed for Europe.

Italian Hospital Finished.—This hospital has been erected partly at the expense of the Italian government; Italy was induced to give $60,000 provided an equal sum was raised in the states. This was raised within two years. Signor Forni, the consul general of Italy to New York, Signor Pagliani, representative of the Italian government to the International Congress on Hygiene and Demography; Celestina Piva, president of the Italian Hospital; Dr. A. Griganti, chairman of the medical board; Luigi Solavi, president of the Italian Chamber of Commerce, and many others made addresses. This new building will accommodate 100 patients and occupies an entire block on the river front.

NORTH CAROLINA

New Hospital in Charlotte.—Plans have been completed for the erection of the new Mercy General Hospital in Charlotte at a cost of $80,000. The hospital is to be in charge of the Sisters of Charity.

Personal.—Dr. Morris M. Caldwell, Wilmington, was dangerously injured in an automobile accident, September 14.——Dr. John McCampbell has been reelected superintendent of the State Hospital for the Insane, Morganton.——Dr. F. O. Hawley, city physician of Charlotte, is ill at his home as the result of a cerebral hemorrhage.——Dr. and Mrs. J. M. Belk and daughter, Monroe, have returned from Europe.——Dr. Oren Moore, Charlotte, has been appointed assistant division seurgeon of the Seaboard Air Line.

PENNSYLVANIA

Collection for Sanatorium.—The fourth annual collection day for the Neversink Mountain Tuberculosis Sanatorium, September 19, netted the Berks County Antituberculosis Society nearly $6,000 for the institution.

Personal.—Dr. Charles B. Forcey, a member of the staff of the State Hospital, Shamokin, has resigned and will practice in the city.——Dr. E. R. Walters, director of the Department of Health and Charities in Pittsburgh, who is ill with small-pox in the Municipal Hospital, is reported to be out of danger.——Dr. Charles E. Cooner, Picture Rocks, who had a slight cerebral hemorrhage, is reported to be improving.——Dr. W. G. Wilson, New Castle, is reported to be seriously ill with cerebral hemorrhage.——Dr. Sarah Morris, Madison, Wis., has been appointed physician to the female students of the University of Wisconsin, Madison.

Philadelphia

Small-Pox on Steamer.—The steamship *Barbarossa*, from Bremen, which was detained at the State Quarantine Station, Marcus Hook, September 17, on account of suspected small-pox, was released a day later after all the passengers had been vaccinated.

Flower Day for Hospital's Benefit.—September 28 was "Flower Day" for the new children's ward of the West Philadelphia Homeopathic Hospital and 200 young women, selling dahlias at Franklin Field and at the Knights Templar review at Belmont, raised $1,800.

Diphtheria Increase.—According to the records of the Bureau of Health for the week ending September 28, fifty-one new cases of diphtheria with eight deaths were reported, an increase of thirteen over the preceding week.——The epidemic of typhoid shows some abatement; twenty-four new cases were reported as compared with thirty last week.

Clinical Study for Women Students.—The Woman's Hospital of Philadelphia offers to women medical students of the senior class in regular medical colleges of Class A the privilege of serving as student assistants to the interns throughout the year. During the year 1911, 1,956 patients were treated in the hospital, 439 babies born in the maternity; 261 abdominal and 1,733 miscellaneous operations were performed, 18,432 visits were made to the clinics and 1,198 visits made in the out-practice departments.

Personal.—Drs. John Albert Kolmer, Albert P. Francine, S. Lewis Ziegler and Ralph Pemberton have returned from Europe.——Dr. W. M. L. Coplin has resigned the position of medical director of the Jefferson Medical College Hospital in order to devote his entire time to his work in pathology. No successor has yet been appointed.——Drs. Howard Hansell and A. A. Bliss have returned from Europe.——Governor Tener reappointed Dr. Charles S. Turnbull a trustee of the Home for the Training of the Speech of Deaf Children before they are of school age.

Lunacy Committee to Investigate Blockley.—Conditions in the insane department of the Philadelphia Hospital that led to the recent suspensions of employees will be investigated by members of the lunacy committee of the board of public charities and they are determined to have an examination conducted into the entire management of the institution, though no date has been set for the conference. The members of the lunacy committee are Judge Isaac Johnson, Media, chairman; P. C. Boyle, Oil City; George W. Ryan, Shamokin; Edward K. Rowland, Philadelphia; Dr. C. B. King, Pittsburgh, and Dr. Frank Woodbury, secretary.

Home for Feeble-Minded.—Dr. Joseph S. Neff, director of public health and charities, awarded, September 17, a contract for the erection of two buildings for the feeble-minded and one building for the care of idiots on the Worthington tract, which constitutes a part of the 800 acres of land owned by the city at Byberry. Later a new institution for the insane and a tuberculosis hospital are to be erected there also. The contract awarded was for $213,000, with a bonded guarantee that the building shall be erected within 200 working days. Toward the establishment of what is believed to be the first municipal institution for the care of the feeble-minded in this country, the city has appropriated $250,000 and the state $200,000.

Medical Colleges Begin Work.—Jefferson Medical College held its eighty-seventh annual opening September 23. Dean Holland introduced the president of the board of trustees, Hon. William Potter. The formal address of welcome was delivered by Dr. Albert R. Brubaker, professor of physiology. ——On the same evening the Medico-Chirurgical College held its formal opening. President Henry F. Walton presided and addresses were made by Dr. Seneca Egbert, dean, Professor Brunell, dean of the dental school, Dr. W. J. Strumer, dean of the department of pharmacy and Dr. George H. Meeker, head of the department of chemistry.——Hahnemann Medical College began its sixty-fifth year September 23 and addresses were made by the Rev. Dr. Floyd Tomkins, Dr. D. Bushrod Jones and the dean, Dr. William B. VanLennep. Following the session, the annual alumni banquet was held.——The opening exercises of the one hundred and seventy-third year of sessions of the University of Pennsylvania were held September 27. After the regular chapel services, Dr. Edgar Fahs Smith, the provost, made the address of welcome.

RHODE ISLAND

Personal.—Dr. H. L. Kristjanson has resigned as assistant superintendent of the Providence City Hospital.——Dr. John W. Mitchell has been reelected president of the corporation of the Providence Lying-In Hospital, and Drs. George L. Collins and R. H. Carver, trustees of the institution.

State Society Meeting.—The fall meeting of the Rhode Island Medical Society was held at the State Hospital, Howard, on invitation of the Board of State Charities and Corrections. The members inspected the hospital and the last new building of the state hospital group which has accommodation for 300 patients. Dinner was served at the institution in the evening, and several cases of pellagra were presented by the medical staff of the hospital.

SOUTH CAROLINA

New Officers.—Second District Medical Society at Blackville: president, Dr. J. S. Matthews, Denmark; secretary-treasurer, Dr. Sophia Brunson, St. Matthews.

State Board of Medical Examiners.—At the annual meeting of the State Board of Medical Examiners at Columbia, organization was effected. Dr. Harry H. Wyman, Aiken, was elected chairman and Dr. A. Earl Boozer, Columbia, secretary. The other members of the board are Drs. J. J. Watson, Columbia; H. L. Shaw, Fountain Inn; P. G. Ellesor, Newberry; J. T. Taylor, Adams Run; W. W. Fennell, Rockhill, and A. M. Brailsford, Mullins.

Personal.—Dr. W. J. Dunn, Camden, fell August 30, fracturing his arm at the shoulder joint. He was taken to New York for treatment.——Dr. H. A. Odom, Springfield, who has been seriously ill at Spartanburg, is reported to be improving.——Dr. J. O. Wilhite, for fifteen years chairman of the Board of Health of Anderson, has resigned.——Dr. W. S. Moore has been elected mayor of Health Springs.——Dr. J. P. Duckett has been elected chairman of the Anderson Board of Health, vice Dr. J. O. Wilhite, resigned.

SOUTH DAKOTA

Personal.—Dr. O. W. Phelps, Lemmon, has converted the upper story of his building into a hospital which will be ready to receive patients, October 1.——Dr. George H. Richards, Chamberlain, sustained severe losses by the recent fire in Chamberlain.——Dr. F. A. Spafford, Flandreau, has sailed for Europe.

New State Board Members.—The governor has appointed as members of the State Board of Medical Examiners, Drs. L. G. Hill, Watertown, F. W. Fryberg, Mitchell, and Frank S. Howe, Deadwood.——Dr. W. E. Daniels, Madison, has been appointed a member to fill the vacancy caused by the expiration of term of Dr. S. H. Graves, Hurlen.

TENNESSEE

Contribution to Tuberculosis Work.——Dr. H. P. Coile, Knoxville, president of the East Tennessee Sanatorium Board, has received a check for $500 from the Brookside Cotton Mills.

Personal.—Dr. J. B. Steele, city physician of Chattanooga, is ill with neuralgia in the city hospital.——Dr. and Mrs. G. McChesney Hogshead, Chattanooga, have returned after an automobile tour of the Eastern states.——S. J. Desha, assistant inspector and chemist in charge of the state laboratories in Nashville, has resigned.

TEXAS

Appropriations Desired for State Hospitals.—The Austin State Hospital has asked for an appropriation of $628,860 for the next biennium, an increase of $105,690.——The Southwestern Insane Asylum, San Antonio, has asked for an appropriation of $728,670, an increase of $299,700 for the biennium.

Epileptic Colony Asks Larger Sum.—The State Epileptic Colony, Abilene, has sent in its estimate for maintenance and improvements for the two years beginning September 1, 1913. The amount required is $315,300 or more than $100,000 more than the appropriation for the last biennium. The contemplated improvements include $75,000 for building and equipping four cottages for patients.

Personal.—Dr. W. A. King has been appointed a member of the San Antonio Board of Health, vice Dr. T. T. Jackson. ——Dr. Benjamin O. Works, Sherwood, has been appointed physician at the Carlsbad Tuberculosis Colony.——Dr. Theodore Dorsett, Gonzales, who was operated on for appendicitis recently in San Antonio, is reported to be rapidly improving.——Dr. J. E. Gilcreest, Gainesville, was operated on recently for the removal of gall-stones, and is reported to be convalescent.——Dr. S. R. Weaver, Sherman, who was operated on early this month at St. Vincent's Sanatorium, Denison, is reported to be making good progress toward recovery.—— Dr. R. J. Gauldin, Dallas, has returned from Europe.——Dr.

L. L. Shropshire, San Antonio, has been appointed city health officer, vice Dr. S. Burg, resigned.

WYOMING

State Medical Meeting.—The Wyoming State Medical Society held its fourteenth annual meeting in Sheridan, September 17, and elected the following officers: president, Dr. Amos W. Barber, Cheyenne; vice-presidents, Drs. R. W. Hale, Thermopolis, O. B. C. Kinney, Thermopolis, and E. S. Lauzer, Rock Springs; delegate to the American Medical Association, Dr. M. A. Newell, Sheridan, and alternate, Dr. Charles H. Solier, Evanston. The society was entertained at a banquet at the Sheridan Inn by the Sheridan County Medical Society. Cheyenne was selected as the next place of meeting.

GENERAL AND FOREIGN

Carnegie Foundation at Rome.—According to the terms of the hero fund recently given by Andrew Carnegie to Italy "no action is more heroic than that of the physicians and nurses who voluntarily offer their services in cases of epidemics."

Extensive Gastro-Intestinal Epidemic.—It is stated that over 1,200 persons at San Giovanni, in Sicily, were taken sick at the same time recently with intestinal disturbances and high fever. The drinking water was found to contain abnormal amounts of nitrites, ammonia and colon bacilli, but no specific germs were found.

Gift for Science in Spain.—The Spanish commission organized to promote scientific research has recently received a gift of $2,400 from Prof. A. Gutierrez of Buenos Aires to found three scholarships for scientific research, in honor of Ramon y Cajal. The latter is president of the commission, and Gutierrez is a native Spaniard although for many years professor of surgery at the University of Buenos Aires.

Dr. von Klein's Translation of the Papyrus Ebers.—Dr. Carl H. von Klein asks us to announce that he has received 700 subscriptions for his English translation of the "Papyrus Ebers," but that he cannot attempt the printing and publishing of the book unless he receives 1,000 advance subscriptions. The book, he says, will consist of approximately 650 pages, and the price will be $5. Subscriptions can be sent to Dr. Carl H. von Klein, Crerar Library, Chicago.

Military Surgeons Meet.—At the meeting of the Association of Military Surgeons of the United States held at Baltimore, October 1-4, Denver was chosen as the next place of meeting. The following officers were elected: president, Surgeon-General William C. Braisted, U. S. Navy; vice-presidents, Surgeon-General Charles Adams, Illinois, Lieutenant-Colonel Jefferson R. Kean, U. S. Army, Surgeon-General Rupert Blue, U. S. P. H. S.; secretary, Major Samuel C. Stanton, Illinois; treasurer, Major Herbert A. Arnold, Pennsylvania.

Mississippi Valley Medical Association.—The thirty-eighth annual meeting of this association, which is to be held at the Hotel Sherman, Chicago, promises to be very successful. The preliminary program, which has just appeared, figures symposiums on obstetrics, nervous diseases and surgery, intestinal surgery and genitourinary diseases. The president's address and the addresses on medicine and surgery will be given October 23 at a meeting held jointly with the Chicago Medical Society. The entertainments thus far provided include a dinner followed by a dance October 22, a smoker October 23, and for the ladies a tea at the Art Institute on October 22 and an automobile ride with luncheon at the South Shore Country Club October 23. The clinics committee, of which Dr. A. J. Ochsner is chairman, has arranged a schedule of clinics beginning October 14 and continuing, with the exception of the days of the meeting, until October 26. The schedule of clinics may be obtained on application to the Secretary of the Committee of Arrangements, Room 1604, 159 N. State Street, Chicago.

Wanted for Embezzlement.—Information has just been received from Adrian, Mich., concerning one William A. Maynard, alias C. H. Maynard, alias C. W. Wilson, who was employed as manager of a collection agency, known as the "Mercantile Law Company." He claims to have engaged in the same business in Buffalo, Boston, New York City and other places. The report states that he comes to a town, rents fine offices, buys elegant furniture on instalment, visits business and professional men, largely physicians; solicits accounts for collection; has a printed contract which customers sign, providing that collector is to hold all money collected for a period of ninety days, and then settle with creditors; he does a large business, collects large amounts, holds them, and leaves the field of operation just before the expiration of the ninety days, rent unpaid, furniture unpaid and all money gone. He may also be found selling books, cheap jewelry, or engaged in similar business. He registers in hotels sometimes from Boston. Maynard is about 49 years old, about 5 feet 6 inches tall, weighs about 160 pounds, is smooth-faced and dark-eyed, and has straight black hair with traces of gray. His four upper front teeth are missing; may wear plate. L. L. Knowles, sheriff of Lenawee County, Adrian, Mich., holds a warrant for this man's arrest and a reward of $50 is to be paid on his conviction. Anyone finding the man is requested to have him arrested and to wire Sheriff Knowles, collect, and an officer with warrant will be sent for the man.

LONDON LETTER

(From Our Regular Correspondent)

LONDON, Sept. 21, 1912.

Death Under an Anesthetic Administered for an Operation Necessitated by a Crime: A Question of Murder

The death of a woman, aged 24, under an anesthetic has raised a curious legal point at the inquest. In April, 1912, the patient's husband cut her throat with a razor. He was tried for attempted murder but convicted of the lesser charge of feloniously wounding, and was sentenced to four years' imprisonment. His motive was that she had left him. The woman recovered from the wound and left the hospital in good health. It was afterward discovered that a nerve in the neck had been severed and an operation to unite the ends was undertaken, during which the patient collapsed and died. Dr. Spilsbury, pathologist, gave evidence that death was due to heart failure, the result of disease of the cardiac muscle. The woman had suffered from rheumatic fever three years previously and there was valvular disease. The coroner said that in this very peculiar case it was for the jury to say whether the husband was criminally to blame for his wife's death. The operation was not a means of preserving life following the injury. If the operation had not been performed, there was the possibility that the woman might have lived. If the jury decided to set aside the question of murder and consider that death was unnatural, they might bring in a verdict of misadventure. This they did and thus the husband escaped the capital charge.

Accidents in Workshops and Factories

The annual report of the chief inspector of factories and workshops, which has just been issued, shows an increase in the number of accidents, which is attributed to increased industrial activity. The number for 1911 was 148,945, as compared with 129,550 for 1910 and 124,325 for 1909. The fatal accidents for these years were 1,182, 1,080 and 1,179, respectively. In the textile trades some of the accidents were due to persons carelessly starting machinery before assuring themselves that others were clear of danger. Attention is drawn to the frequency with which blood-poisoning follows minor wounds; to the desirability of providing factories and workshops with sterilized dressings. A relation between dust and tuberculosis was observed in cotton-waste factories and in lace-making. But in some of the dusty trades sickness has largely disappeared, owing to improved methods of ventilation, the introduction of exhaust apparatus, and in cement works, owing to the use of the rotary kiln It is noteworthy that among the cement workers of Great Britain there is nothing like the amount of sickness and acute lung disease observed in Germany. The number of accidents in electric generating stations was seventy-four, of which four were fatal, against fifty-eight for 1910, while the number of electrical accidents in factories other than electrical stations was 290, of which seven were fatal, as against 276 with five deaths in 1910. Exposure to poisonous gases was responsible for a number of casualties. Carbon monoxid heads the list—sixty-four casualties and six deaths; nitrobenzin is second—twenty-one casualties and no deaths; sulphuretted hydrogen is third—eight casualties and two deaths. Each annual report shows that progress is being made in extending the use of leadless paints and in substituting wet rubbing-down of painted surfaces for dry sand-papering.

The National Insurance Act

The British Medical Association and the government are no nearer to coming to terms than was stated in my previous letters to THE JOURNAL, though the medical benefits of the act come into force in January, 1913. Although no public announcement has been made, it is stated that the government is taking active steps to prepare for the situation which will then present itself. It is not unlikely, says a government organ (*The Daily News*), that more than one method

will be adopted. In some areas it is alleged that a panel of physicians willing to serve according to the terms of the act will be formed. In areas in which a panel cannot be created, two courses will be open. The first is to administer medical benefit through a whole-time physician; the second is to return the capitation grants so that a committee of the insured can make their own arrangements. It is not improbable that the act will prove only a step to a state medical service which will deal with the health of the public as education is already dealt with. On the other side, there is no sign that the profession has weakened in its practically unanimous opposition to the act. Though the pledges to resign all contract practice do not come into force until January, 1913, it is announced by the Leeds branch of the association that all members holding friendly society appointments will resign them at the end of the present month. In the Pudsey district the physicians resigned a month ago and there are 8,000 friendly society members without a physician. Some are paying for medical attendance in the ordinary way. The rest banded themselves together and engaged a physician from one of the small islands off the coast of Scotland, but at the last moment he changed his mind and declined to come.

PARIS LETTER

(From Our Regular Correspondent)

PARIS, Sept. 13, 1912.

Physicians and the Classics

Much regret is being expressed at the lowering of the educational level through neglect of the classics and concentration along special lines. A League for French Culture has been organized to influence public opinion toward restoring the study of the classics. In the latest publication of the league, by Dr. Grasset of the Montpellier University, the classics and a broad training in literature and philosophy are considered essentials in the education of a physician. Dr. Grasset has no patience with those who differentiate scientific physicians from practical physicians; there ought to be but one category, in which the physician is at once scientist and practitioner. With the advance of medical science its use by the practitioner becomes daily of more importance. A physician should not depend on intuition, for the battle against disease demands a keen mind, well trained and methodical. With the advance in medicine this necessity becomes all the more pressing. Formerly diagnosis was based on ascertaining the anatomic condition of diseased organs, in being able to localize a heart sound or a pulmonic râle. To-day it is far more complicated; above all it is necessary to make a good clinical diagnosis, to take account of the function of an organ. But for this it is not sufficient to interpret obvious signs. It is necessary to collate a series of symptoms, to judge absolute and relative values, to classify and to coordinate them. Psychology is necessary in the education of the future physician not only for the study and treatment of mental and nervous diseases but also for all diseases; the mental condition of the patient must be considered, and the physician must have familiarized himself with the methods, processes of observation and general discipline of psychology. Humanity, according to Dr. Grasset, has a fundamental need for good physicians in the deepest sense of the word. A bad or indifferent physician may do mischief and is a menace to society.

Communal Medical Service

According to a decision of the municipal council of the Commune of Grossiat, in the Department of the Ain, any French person who has lived there a year will have the right to consult any physician without charge; the price of the consultation, 2 francs (40 cents), is represented by a voucher deposited with an official by the patient and given to the physician afterward. Each person, in case of necessity, may be visited at home by any physician, the town paying two-thirds of the price of the visit, 4 francs (80 cents), to the physician, the patient promising to pay the remainder. The agreement is recorded and if the patient does not pay, he will forfeit further medical privileges. Consultation and visits include also minor operations like extraction of teeth, opening surface ulcers, analysis of urine, etc. If the visit is at night the additional fee is paid by the patient, and similarly when there is consultation with another physician, or deliveries, accidents or surgical operations. Societies, corporations and persons, such as paupers, who have already the right to free treatment are excluded from the privilege. Physicians save the vouchers and present them for payment by January 15 of each year.

Progress of Medical Service Among the Natives in the Colonies

On the Ivory Coast, which is the newest French colony, medical service is making rapid progress. The negroes are giving up more and more their opposition to the introduction of European medicine. The average number of consultations during recent years was 100,000, while the total this year was 261,000, exclusive of vaccinations. In addition to the enforcement of sanitary laws, no opportunity is lost to familiarize the natives with medical treatment. Government officials on their rounds are accompanied by native attendants from the hospitals, who vaccinate the negroes and give them medical treatment under the direction of physicians.

Death of Professor Schmitt

Dr. Joseph Schmitt, professor of clinical medicine at the Faculté de médecine de Nancy, is dead at the age of 57. He had been *agrégé* professor since 1883 and had been professor of therapeutics and of materia medica. In 1910 he succeeded Professor Bernheim in the chair of clinical medicine.

Paul Bourget and Psychiatry

I have already mentioned the great esteem that Paul Bourget expresses for mental medicine (THE JOURNAL, Nov. 21, 1908, p. 1793). He believes firmly in the almost unlimited future of this science and is persuaded that in particular the literature of observation, in which he includes history, criticism, the novel and the drama, will be enriched by it. Bourget dedicates his latest book, called "L'Envers du Décor" to Dr. Dupré, one of our most distinguished psychiatrists. While recognizing that there is in art an element which does not exist in science, Bourget believes that science ought to be the basis even of art. So far as literary art in particular is concerned, he is convinced that novelists and dramatists *quand ils inventent vivant* cannot be in contradiction with psychiatry, for instance. The name of psychiatry and the science which it designates did not exist, he says, when the great creators of souls conformed themselves to the laws that this science was one day to formulate. In conceiving Othello, Shakespeare gives him all the traits of the delirium of jealousy, classed to-day among the progressive degenerative psychoses. With profound intuition he has even taken the care to mark his creation with a neuropathic taint. In Argan, Molière draws a type of melancholic neurasthenia, the clinical picture of which might have place in a treatise of mental disease without a feature changed. According to Bourget these examples suffice to show that the effort of genius consists simply in discovering by intuition the laws that scientists discover by a humble and more patient method. The artist, indeed, adds movement to them. He sees these laws in action and on this condition alone he is an artist. Bourget himself, in spite of the present reaction against the abuse of intellectualism, persists in believing that Sainte-Beuve and Taine were right when they called on writers to submit their minds more and more to severe scientific discipline.

BERLIN LETTER

(From Our Regular Correspondent)

BERLIN, Sept. 14, 1912.

Personal

Professor Hess, of Würzburg, has accepted the appointment as successor of Eversbusch at Munich.

Professor Kaup has received a call to the chair of the newly established professorship for hygiene, especially trade hygiene, medical statistics and social hygiene at Munich.

Professor Leube, the distinguished clinician, celebrated on September 14 his seventieth birthday. Leube has been living at Stuttgart since last year, at which time he resigned his position as director of the Würzburg medical clinic. His importance in internal medicine is so well known that it is scarcely worth while to discuss it, but attention may be briefly called to the fact that credit is due to him for the introduction of Kussmaul's stomach tube into medical technic; and that he and Ewald have advanced in marked degree the therapy of gastro-intestinal diseases. Even at present his treatment of this subject in Ziemssen's "Handbook of Pathology and Therapy" is still a model. In connection with these studies his work on nutrition is prominent. The meat solution introduced by him and the physiologist Rosenthal is well known. His "Diagnosis of Internal Diseases" is one of the most prominent works of medical literature of the world. Of late years Leube has busied himself extensively with the epidemiology of tuberculosis.

Professor Soltmann, director of the university pediatric clinic at Leipsic, died suddenly September 11, at the age of

67. He has published numerous physiologic and clinical works on the entire field of pediatrics. In the early part of his academic career he devoted himself largely to the nervous diseases of childhood.

The International Congress on Gynecology and Obstetrics

The sixth international congress of gynecologists met at Berlin from September 9 to 13, under the presidency of the Berlin gynecologist, Professor Bumm. About 250 German and foreign gynecologists took part. The chief interest of the proceedings was furnished by two reports, namely, the treatment of peritoneal wounds, and the surgical treatment of uterine hemorrhage in pregnancy, labor and the puerperium; these reports brought out a very lively discussion.

TREATMENT OF PERITONEAL WOUNDS

Professor Franz, of Berlin, who made the leading report on the treatment of peritoneal wounds, considers the infection of the peritoneum as positively avoidable, even if a part of the infections of the peritoneum are not attributable to infection from the outside, but to the autogenous germs of the patient. To avoid this, he knows yet of no remedy, although the further development of the technic may be of assistance. The prophylaxis of peritonitis, which can be accomplished in animal experiments by several methods, is not to be recommended for human beings, as it is not free from danger. Macnaughton Jones of London reported on the basis of question-blanks filled out and returned by sixty-seven leading obstetricians and gynecologists of the United Kingdom. The dry handling of the peritoneum was preferred by most of the operators. He discussed further extensive asepsis, material for sutures and ligatures, the importance of previous gonorrhea, which demands special therapeutic and preventive measures, and the use and value of vaccine treatment. Resinelli, of Florence, discussed the tolerance of the peritoneum for physical, chemical and biologic irritations. The importance of these lesions lies in the great extent of the peritoneal surface, in its power of absorption, and in its immediate connection with the most important of the internal organs. In operations, therefore, the operation field must be isolated from the rest of the peritoneal cavity as completely as possible. Kouwer, private physician of Queen Wilhelmina of Holland, emphasized the importance of correct operative technic to diminish as much as possible the possibility of infection from the already infected organs. In contrast to asepsis in operation, chemical, thermic and mechanical asepsis is of minor importance. It is closely connected with the personality of the operator, which must be taken into consideration in estimating results. Von Mars, of Lemberg, refers the differences in the results of the authors to the varying quality of the operation material and the varying organization and equipments of the hospitals. Lecène, of Paris, refers the progress of the last ten years to the better choice of the time, kind and extent of the operation, to the employment of sterilized rubber gloves, strict asepsis, and proper indications and better maintenance of drainage of the peritoneum. Josephson of Stockholm spoke of the prophylaxis of the operation, especially of cancer of the neck of the uterus, and expatiated on the preventive action of camphorated oil, according to the plan of Pfannenstiel and Hoehne, the use of which deserves further trial. Hoehne, of Kiel, discussed, on the basis of clinical experience in 271 cases, the irritative treatment of the peritoneum by means of camphorated oil for the prevention of peritonitis. In the care of wounds in abdominal radical operations on the uterus, Hannes recommends a separate drainage of the pelvic cavity and the peritoneal cavity.

OPERATIVE TREATMENT OF UTERINE HEMORRHAGE

Professor Couvelaire, of Paris, and Professor Jung, of Greifswald, delivered the addresses on the surgical treatment of uterine hemorrhage during pregnancy, delivery and childbed. Couvelaire limited himself to an explanation of the present position of principles and practice among French obstetricians. By surgical treatment is meant the removal of the uterus or cesarean section, abdominal or vaginal. In hemorrhages which are the result of the low position of the placenta, French clinicians only rarely resort to operation, as by pure obstetric methods in 534 deliveries the mortality of the mothers has only been 8.2 per cent., in which number cases brought to the clinic in a hopeless condition are included. Only 1.2 per cent. died from hemorrhage. However, the mortality of the newborn is very high by this method, but it is the result of their low vitality. Only in the specially complicated cases, particularly in infections, the French clinicians resort to operations. The method of the French obstetricians is different in hemorrhages before the delivery of the normally placed placenta, in which, in severe cases, there is still a mortality of 40 per cent. In hemorrhages in the uterine walls, extirpation of the uterus is indicated. In other cases the method to be applied is determined by the condition of the individual case. The reporter closed his address with the statement that with the exception of those cases in which surgical treatment is to be preferred, progress will depend more on the earlier attendance of the physician on the pregnant woman and on the better training of physicians in obstetrics.

Jung of Greifswald presented the more active surgical position usual in Germany. He considered the various individual processes which are necessary against hemorrhage. In abortions surgical measures are necessary only in extremely rare cases; in general, manual removal of the débris is sufficient. In complications of pregnancy by bleeding myoma or carcinoma, surgical removal is always indicated, provided that the cancer is operable. During delivery in the case of premature separation of a normally placed placenta, the indication is to deliver as quickly as possible, if necessary by surgical operation. In the milder cases of a low-lying placenta the introduction of a hydrostatic bag secures the desired result. In ruptures of the uterus, abdominal section is indicated, while in so-called atonic bleedings, caused by imperfect contraction of the uterine muscles, remedies to arouse contraction should first be applied. In the puerperium, Jung advocates more expectant management of hemorrhage. In the conclusion of his report he describes the various methods of compression of the aorta, which are applicable for temporary arrest of the bleeding until further surgical aid is possible. The best method at present is that proposed by Momburg by passing a tube about the body. A report on operative treatment of uterine hemorrhage was made by Davis of Philadelphia, who declared himself in favor of surgical treatment of placenta prævia in the form of cesarean section, as the only life-saving method for mother and child; as a proof of this he introduced numerous examples from his clinic. Zweifel of Leipsic called attention to the fact that in Germany pregnant women with severe hemorrhage during labor are taken to the hospital in a different stage of delivery from that customary in France. In Germany the chief danger of bleeding is removed by the customary version of the fetus, but this often has an injurious effect on the child. The hospital must take the child more into consideration and apply the new surgical methods; this position Zweifel only recently began to advocate. He limits cesarean section to cases of placenta prævia totalis, with a full-time fetus, and in the absence of any infection. La Torre of Rome recommends the compression of the aorta, according to Momburg, while Mayer of Tübingen calls attention to the danger of this in case of diseased kidney. Pankow of Düsseldorf is opposed, on the basis of anatomic investigations in placenta prævia, to any method which takes no account of the laceration and imperfect power of contraction of the neck of the uterus. For this reason he recommends cesarean section which avoids this over-extension and saves both mother and child, provided that patients with premature hemorrhage are brought to the clinic as early as possible. Jolly and L. Hirsch of Berlin made suggestions regarding the treatment of atonic hemorrhages. The former removes atony of slight degree by the introduction of a bag filled with compound solution of cresol; the latter recommends the injection of ergotin into the muscles of the uterus.

Illegible Prescriptions

One of the bad habits prevalent among physicians is the writing of illegible prescriptions. The Berlin police authorities have thought it necessary to call attention to this evil in a letter addressed to the executive committee of the Berlin medical chamber. In this letter it is noted that of late mistakes have again occurred due to the fact that pharmacists either could not read the prescriptions of physicians on account of the poor chirography, or else misunderstood them and filled them incorrectly. The danger resulting from this was lately increased through a circumstance not previously observed, namely, that physicians in increasing numbers fail to add explicit directions to their prescriptions, even in cases of active and poisonous remedies, and therefore deprive the pharmacists of an important aid. It has already happened that medicines for external application have been given to the public in place of remedies intended to be taken internally. An illustration of such an occurrence is the following case which recently came to trial. An apothecary, C. B., who was employed in a large Berlin pharmacy, read and dispensed atropin in place of morphin which was written on the very

illegible prescription. The result was that the patient, in this case the wife of a physician, suffered a syncope on taking the medicine. The apothecary was accused on the ground of criminal carelessness. However, the court acquitted him because the evidence showed that the writing on the prescription was so illegible that atropin in place of morphin might have been read very readily.

VIENNA LETTER

(From Our Regular Correspondent)

VIENNA, Sept. 5, 1912.

The Results of Salvarsan in Two Thousand Cases

Dr. Woldovar, in a paper read before the Army Medical Society, reported the results of injection of salvarsan in 2,000 cases of syphilis in all stages. He used the monacid solution and gave always intramuscular (gluteal) injections. The dose was generally 0.5. As regards the after-effects, a rise in temperature was noted in about 30 per cent. of all patients, which lasted from one to four days, without any ill effect. In about 0.5 per cent. of all injected cases an arsenic intoxication occurred, as shown by diarrhea, vomiting or nausea, dryness of the mouth and loss of appetite. A curious incident was a troublesome paralysis of the peroneus muscle, which happened seven times; it was most likely due to too deep injection which injured the peroneal fibers of the sciatic nerve. In 0.5 per cent. of the cases nervous relapses appeared after the injection but not a single death happened in the series. The author kept the patients over two months under observation, which is easily effected in the army. The therapeutic results were excellent, especially as regards primary and secondary lesions and manifestations of syphilis on the mucous membranes, but a definite cure, that is, absolute freedom from spirochetes, has not yet been proved, owing to the short time of observation.

Marriages

JOHN ALBERT KOLMER, M.D., Philadelphia, to Miss Bessie Cecelia Herron of Freeland, Pa., in New York City, September 18.

SMITH FULLER HOGSETT, M.D., Pittsburgh, to Miss Clara Heaton Gans of Uniontown, Pa., at Swissvale, Pa., recently.

CHESNEY MACAULEY RAMAGE, M.D., Fairmont, W. Va., to Miss Blake Lemley, at Cassville, W. Va., September 18.

RAYMOND T. MCGURK, M.D., to Miss Mamie Belle Robinson, both of Stockton, Cal., in San Francisco, September 15.

LOUIS DANIEL JOSEPH, M.D., Bradford, Pa., to Miss Mirian Davis of Titusville, Pa., at Buffalo, N. Y., September 2.

H. G. DIFENDERFER, M.D., Beaverdale, Pa., to Miss Millie M. Shiffer of Expedit, Pa., in Philadelphia, September 25.

HARRISON BENJAMIN KERN, M.D., Slatington, Pa., to Miss Elizabeth Hopkins of Lancaster, Pa., September 12.

THEODORE FLETCHER MEAD, M.D., New York City, to Miss Lena Ruth Fahnestock of Ithaca, N. Y., June 10.

ALEXANDER DONALD FERGUSON, M.D., to Miss Dorothy Williams, both of Chicago, September 25.

ROBERT ALLEN DAVIS, M.D., to Miss Julia Mae Calvert, both of Clifton Forge, Va., September 18.

CHARLES CHAUNCEY WINSOR JUDD, M.D., to Miss Mildred Rife, both of Baltimore, September 21.

RALPH H. LOOMIS, M.D., Sidney, N. Y., to Miss Fanny P. Stowell of Rockford, Ill., September 11.

WILLIAM E. NEAL, M.D., to Miss Susan Witten, both of Huntington, W. Va., September 11.

HASKILL M. COHEN, M.D., Denver, to Mrs. Jeannette L. Joseph, in California, recently.

CLYDE JEFFREY SMILES, M.D., to Miss Grace Weir, both of Ashland, Wis., September 6.

EDGAR J. HUENEKENS, M.D., to Miss Helen Fish, both of Minneapolis, September 21.

RICHARD S. WEISS, M.D., to Miss Anna Newman, both of St. Louis, September 23.

CARL G. W. JUNGK, M.D., to Miss Helen Ball, both of St. Louis, September 12.

JACOB HALL, M.D., to Miss Lula Marcee, both of Kansas City, Mo., recently.

Deaths

Thomas Jefferson Mitchell, M.D. University of Pennsylvania, Philadelphia, 1852; a member of the American Medical Association and president of the Mississippi State Medical Association in 1904-1905; treasurer of the American Medico-Psychological Association; surgeon of the Thirty-Ninth Mississippi Infantry, C. S. A., throughout the Civil War; superintendent of the Mississippi State Insane Hospital, Jackson, from 1878 to 1910; widely known as an expert on nervous and mental diseases and insanity; died at his home in Jackson, September 15, from senile debility, aged 82.

Charles Nelson Ballard, M.D. Rush Medical College, 1890; a member of the American Medical Association; formerly of Chicago and associate professor of gynecology in the College of Physicians and Surgeons, Chicago; assistant surgeon to the Marion Sims Hospital and attending gynecologist to the Westside Free Dispensary; who moved to Oklahoma four years ago locating in Oklahoma City; died at his old home in Logansport, Ind., September 21, a short time after a surgical operation, aged 43.

Jacob Baxter, M.D. New York University, New York City, 1854; Bellevue Hospital Medical College, 1866; Trinity Medical College, Toronto, 1891; a member of the Ontario legislature from 1867 to 1898 and speaker of that body from 1887 to 1891; thereafter registrar of Haldeman County, Ont.; died at his home in Cayuga, July 23, aged 80.

William B. Lawrence, M.D. Vanderbilt University, Nashville, Tenn., 1905; a member of the State Medical Association of Texas; for several years secretary of the Kerr-Kendall-Gillespie-Bandera County Medical Society and local surgeon for the San Antonio and Aransas Pass Railroad; died at his home in Comfort, June 21, aged 31.

Daniel B. Street, M.D. University of Georgetown, D. C., 1874; a member of the Medical Association of the District of Columbia; dean of the staff of Sibley Hospital, Washington, D. C.; a veteran of the Civil War; died at the home of his daughter in Moose Jaw, Sask., September 18, from heart disease, aged 70.

Francis M. Daily, M.D. College of Physicians and Surgeons, Keokuk, Iowa, 1878; a member of the American Medical Association; professor of surgery in the University of Kansas; local surgeon at Beloit for the Missouri-Pacific System; died at his home in Beloit, September 14, from heart disease, aged 58.

John Lawrence Hughes, M.D. College of Physicians and Surgeons, New York City, 1899; a member of the American Medical Association and health officer of Mount Vernon, N. Y.; died in a hospital in New Rochelle, N. Y., September 20, from the effects of an automobile accident, aged 35.

Herbert W. Davis, M.D. University of Buffalo, N. Y., 1883; a member of the Medical Society of the State of New York; for more than twenty years a practitioner of Falconer, but for two years a resident of Jamestown; died at his home in that city, September 17, from cerebral hemorrhage, aged about 50.

George Gleim, M.D. University of Pennsylvania, Philadelphia, 1865; a member of the Medical Society of the State of Pennsylvania; for twenty-one years physician to the Cornwall estate, and thereafter a practitioner of Lansdowne; died at his home in that place, September 21, aged 69.

Christian N. Bishoff, M.D. Eclectic Medical College of Pennsylvania, Philadelphia, 1871; for two terms a member of the Kansas State legislature; for thirty-five years a practitioner of Eudora Township, Douglas County, Kan.; died at his home near Eudora, September 22, aged 74.

Harry Allison Roscoe, M.D. Medico-Chirurgical College of Philadelphia, 1903; Hahnemann Medical College, Philadelphia, 1904; a member of the Medical Society of the State of Pennsylvania; died at his home in Pittsburgh, September 22, as the result of an automobile accident.

John W. Cowden, M.D. Reform Medical College of Georgia, Macon, 1855; for more than half a century a practitioner of Petersburg, N. C.; died at his home, September 20, from the results of injuries sustained in a runaway accident, aged 76.

Francis Hosea Fisk, M.D. Eclectic Medical Institute, Cincinnati, 1857; a Confederate veteran; at one time editor of the *Eclectic Medical Journal* and a professor in a St. Louis medical college; died at his home in Nashville, September 13, aged 76.

William Higgison Aplin, M.D. State University of Iowa, College of Homeopathic Medicine, Iowa City, 1883; a member of the Missouri State Medical Association; died at his home in Hamilton, September 13, from appendicitis, aged 65.

George Washington Opie Maupin, M.D. Bellevue Hospital Medical College, 1869; a member of the Medical Society of Virginia and a Confederate veteran; died at his home in Portsmouth, September 17, from cerebral hemorrhage, aged 67.

Edmund F. Steckel, M.D. Jefferson Medical College, 1862; assistant surgeon of volunteers during the Civil War; revenue assessor of Lehigh County, Pa., for several years; died at his home in Allentown, September 18, from uremia, aged 71.

Augustus Sargent Bolster, M.D. Dartmouth Medical School, Hanover, N. H., 1890; a member of the American Medical Association; died at his home in Worcester, Mass., September 3, from left hypernephrosis, aged 45.

Robert Drakely Gardner, M.D. Eclectic Medical Institute, Cincinnati, 1855; for more than half a century a practitioner of Decatur County, Iowa; died at his home in Leon, September 13, from senile debility, aged 86.

Frank Edward Lewis, M.D. Cleveland University of Medicine and Surgery, 1886; vice-president of the New York State Homeopathic Medical Society; died in his home in Albany, N. Y., September 10, aged 57.

John Stark Rhodes, M.D. University of Louisville, Ky., 1888; a member of the State Medical Association of Texas; died at his home in Prairieville, July 4, from chronic nephritis, aged 54.

Edwin Weston Trueworthy, M.D. University of Vermont, Burlington, 1865; a member of the Massachusetts Medical Society; died at his home in Lowell, Mass., September 13, aged 73.

Thomas A. Hays, M.D. Hospital College of Medicine, Louisville, 1875; for several years a lecturer in his alma mater; died at his home in Louisville, September 17, from pneumonia, aged 58.

William Mitchell, M.D. Eclectic Medical Institute, Cincinnati, 1881; for twenty-seven years physician of Washington County, Ohio; died at his home in Marietta, September 2, aged 61.

James Thomas Grace, M.D. Jefferson Medical College, 1900; formerly of Kalamazoo, Mich.; died at his home in Cleveland, Okla., September 13, from the effects of a kick of a horse.

James Leonard Vineyard, M.D. Reform Medical College of Georgia, Macon, 1849; of Simpson, Ga.; died at his old home in Rock Mills, Ala., about September 16, aged 85.

A. M. Gould, M.D. University of Pennsylvania, Philadelphia, 1877; died at his home in Wildwood, Cleveland, Tenn., September 18, from cerebral hemorrhage, aged 75.

Frank H. White, M.D. Kansas Medical College, Topeka, 1905; died at his home in Effingham, Kan., September 23, from acute dilatation of the heart, aged 37.

Brock Mayfield, M.D. Missouri Medical College, St. Louis, 1890; died suddenly at his home in Lynnville, near Jacksonville, Ill., September 13, aged 54.

Edmund Henry Graham, M.D. Western Pennsylvania Medical College, Pittsburgh, 1901; died at his home in Stahlstown, Pa., July 31, aged 47.

John Fields Place, M.D. University of Michigan, Ann Arbor, 1874; died at his home in Binghamton, N. Y., September 14, from heart disease, aged 61.

Jefferson Cary, M.D. Medical School of Maine, Brunswick, 1878; of Caribou, Me.; died at his summer home at Round Pond, August 25, aged 71.

Daniel J. Harmon (license, Tennessee, 1889); died at his home in Morristown, about September 12, from cerebral hemorrhage, aged 70.

James Joseph Stanford Doherty, M.D. New York University, New York City, 1874; died at his home in New Haven, Conn., July 5, aged 61.

William C. Manley, M.D. American Medical College, Eclectic, St. Louis, 1879; died at his home in Franklin, Ill., September 11, aged 63.

Harold Townsend Prentiss, M.D. Baltimore Medical College, 1893; died recently at his home in Holyoke, Mass., aged 43.

William A. McClain, M.D. Medical College of Ohio, Cincinnati, 1888; died recently at his home in Detroit, Mich., aged 54.

William J. Johnston, M.D. Queens University, Kingston, Ont., 1891; died recently at his home in Merrickville, Ont.

William W. Giesy, M.D. Willamette University, Salem, Ore., 1881; died at his home in Aurora, Ore., September 18.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

THE PROPRIETARY EVIL

How the New York "Sun" Views It

The evils connected with the prescribing of "ethical proprietaries" are, as we have repeatedly said, a menace not so much to the medical profession as to the public. It is not surprising then, in view of the present wide-spread interest of the layman in all things medical, that the "proprietary" evil is beginning to be recognized as something entirely distinctive from the "patent medicine" curse. As THE JOURNAL has said time and again, the abuses in the proprietary medicine world will continue just so long as the medical men will tolerate medical journals whose revenue is largely derived from the advertising of fraudulent proprietaries. The public is waking up to this fact. We reproduce here in full an editorial that appeared in the *New York Sun* for September 21, under the caption "A Serious Menace to the Medical Profession." It gives the medical profession an opportunity to see itself as others see it:

"The absence of cooperation among physicians in the promotion of their interests is a matter of frequent observation. It is therefore gratifying to record an instance exemplifying the recognition of a danger menacing both the public and the profession, and the action taken by at least one organization to meet it.

"The State Medical Association of Missouri has adopted a resolution which pronounces it 'derogatory to the best interests of members to publish articles in medical journals whose advertising pages contain fraudulent or questionable advertisements.' The lay reader cannot realize the importance of this enactment, not for the doctor alone but also for the interests of the public, which is the unsuspecting victim and the greatest sufferer from the abuses this resolution is aimed to correct, the prescription of secret nostrums and other proprietary drugs by physicians. It is not generally known that there are numerous drugs which have never been shown to possess the slightest palliative, much less curative, properties, but which by reason of skilful and persistent advertising have come to be credited with more or less valuable properties; and there are other drugs more or less efficient as palliatives, the manufacture of which is secret, which are exploited under various designations, names or devices. Some persons say they have been benefited, others that they have been actually cured by these secret nostrums; just as many declare they have obtained similar benefit from all kinds of treatment, magnetic cures, healers, masseurs, etc.

"THE JOURNAL of the American Medical Association has for some time bravely urged the importance of checking the use of these nostrums which have unfortunately become popular among doctors who are incapable or too indolent to devise their own formulas. And they are encouraged, indeed actually taught, in their uses by certain medical journals of otherwise good repute, which thrive on large incomes from the advertisements of the manufacturers. It is so much easier to write a prescription for X's Nerve Tonic than even to write the ingredients of which it pretends to be composed and the properties of which are well known. Worse than this is the prescribing of preparations for the composition of which and their curative value the physician must trust to the manufacturer, whose chief interest lies in their financial success. The ingredients if stated are not mentioned in the text-books on drugs. A glib tongued agent calls at the doctor's office, thrusts on him samples and so-called literature, laudatory and alluring by titled names of which he has never heard. The headache medicine, for instance, is prescribed; it alleviates probably because it contains a coal-tar preparation. Instead of prescribing the latter himself he gives the next patient this nostrum. The result is that on the next similar occasion the patient buys the nostrum from the druggist without visiting the doctor; not rarely he recommends it to others. The druggist alone reaps the benefit, while the doctor and the patient suffer losses they little suspect.

"The credulity of the unthinking doctor is not a whit beneath that of the misguided layman, but it is far more contemptible. For this reason the public needs to be warned against doctors who prescribe drug preparations bearing some definite name or title rather than a regular prescription. There never was a time when drugs were so universally and freely used by lay persons, and the chief reason may be found in the recklessness with which named proprietary medicines not mentioned in the text-books are prescribed by doctors. The Latin prescription, though antiquated, is at least not so easily duplicated.

"If respectable medical journals would refuse advertisements to secret or semi-secret nostrums they would not be used by physicians. Since these medical journals derive their principal revenue from advertisements, it is not in human—commercial—nature to adopt this suicidal course. The remedy lies in the adoption of the course pointed out above by the lay public and the unwavering disciplining of physicians who lend their influence by publishing articles in these journals which carry advertisements of nostrums. The American Medical Association owes it to the medical profession, the best types of which it represents, to emulate the action of the Missouri Medical Association and thus protect the professional interests which are seriously menaced and also protect the public against indolent and ignorant doctors."

PHENACETIN AND ACETPHENETIDIN

A physician-pharmacist writes: "If a prescription calls for 'phenacetin,' should the pharmacist dispense 'phenacetin-Bayer'—that is, the phenacetin manufactured by the original patentee—or would he be justified in dispensing the official acetphenetidin, manufactured by any reliable chemical or pharmaceutical house?"

Unless the pharmacist happens to know that the physician in writing the prescription desired the Bayer brand, he would be justified in dispensing acetphenetidin, U. S. P. As a general thing, physicians use the word "phenacetin" without intending to prescribe any particular brand or make, simply because they are familiar with this word and are not familiar with the official term "acetphenetidin." They will doubtless continue to use the term "phenacetin" and we know of no sufficient reason for doing otherwise. During the life of the patent the word "phenacetin" became a familiar one, and the product became generally known by this term. But a coined name for a patented article loses its proprietary character and becomes the common name of the article when the patent expires. In other words, when the patent expires, not only the product but also the name itself becomes common property. This principle has been recognized by the courts. Those who formerly controlled the product and the name "phenacetin" evidently recognized this principle, for they have taken no steps to prosecute a firm in this country which sells the product openly under the name "phenacetin." It might be added that the preparation is official in most foreign pharmacopeias under the name "phenacetin." In agreement also with this principle the Council on Pharmacy and Chemistry (THE JOURNAL, April 27, p. 1298) lists in New and Nonofficial Remedies such products as "lanolin," "phenacetin," "sulphonal" and "trional" as non-proprietary names applied to Adeps lanæ hydrosus, U. S. P., Acetphenetidinum, U. S. P., Sulphonmethanum, U. S. P., and Sulphonethylmethanum, U. S. P., respectively.

In view of these facts—and also bearing in mind the findings of the Association's Chemical Laboratory (THE JOURNAL, March 16, p. 801) that the preparations on the market under the title "acetphenetidin" are of equal quality with the preparations sold under the name "phenacetin"—the pharmacist should recognize that acetphenetidin is identical with phenacetin, and that he may dispense the former when phenacetin is prescribed, provided, of course, that no special brand of phenacetin is ordered.

It is the physician's privilege, of course, to specify the goods of a particular manufacturer, but in view of the fact brought out above that all brands of this chemical have tested up to the U. S. P. standard, it is placing an unnecessary burden on the pharmacist to require him to have on hand many different brands of one substance. The physician should save this privilege for use when prescribing some product that differs materially in its various forms on the market, as for example in the case of certain fluidextracts.

Physicians will doubtless find that the above comments will interest their local pharmacists. It is of mutual value for physicians to talk these matters over with their pharmacists.

Correspondence

Priority of Employment of the Roentgen Ray in Studying the Physiology and Pathology of the Digestive Tract

To the Editor:—In June, 1896, an article appeared in the *Boston Medical and Surgical Journal*, page 609, entitled "Photography of the Human Stomach by the Roentgen Method," by John C. Hemmeter. This report, although not published until two months after it was sent to this journal (for I received acknowledgment of its acceptance April 10, 1896), is printed under the date of June 18, 1896.

This antedates any other publication on this subject in the English language. Wolf Becker (*Deutsch. med. Wchnschr.*, March 26, 1896) at about the same time had experimented on the stomachs of animals by filling them with solutions of lead acetate (sugar of lead) after laparotomy, and in doing so he tore the walls of the stomach, which were sewed up again, but not so tightly as to prevent leakage. The solution therefore leaked out into the abdominal cavity and only a diffuse, badly defined photograph was obtained by the *x*-rays. In April of the same year Carl Wegele (*Deutsch. med. Wchnschr.*, July, 1896) had advised experimentation with a spiral metallic electrode introduced into the stomach. His paper was merely a suggestion—he did not report that he had produced any real skiagrams of the stomach; in fact, by this method it was impossible to make them. One might photograph the electrode, but not the stomach. Becker from his own statements worked only on animals and Wegele could produce no photographs whatever of the stomach.

In 1896 I had already made skiagrams of the entire stomach by the method described in the *Boston Medical and Surgical Journal*, June 18, 1896. The work was done in the physical laboratory of the State Normal School in Baltimore with the assistance of the professor of physics at that time, Prof. A. Hammer, and my associate, Dr. Harry Adler. The work was elementary and there were failures that were unavoidable with the apparatus available sixteen years ago. It cannot be denied, however, that *x*-ray photography of the digestive canal was originated as pioneer work then and there, and the work of Rieder, Haudek, Holzknecht and other meritorious clinicians in Germany and this country came after mine. It has occasionally been asserted even by American writers that the *x*-rays were not employed in the diagnosis of precisely stated conditions of the digestive tract until 1907, and then only by Germans. It has been acknowledged by Ewald and Boas as well as Haudek and the entire school of clinical medicine in Vienna, where most of this special kind of clinical radiology is now done, that the first employment of *x*-rays for the diagnosis of ulcer of the stomach was conceived and undertaken by me.

In fact, I possess letters of appreciation and congratulation from my friends, Professors Ewald and Boas of Berlin, in which they compliment me and my co-workers as being the pioneers of this special type of radiology. The main reason why they are so conversant with the history and character of the radiologic work of my clinic is to be found in the fact that I published the first complete account of it in a German journal (Neue Methoden zur Diagnose des Magengeschwürs, *Arch. f. Verdauungskr.*, 1905, xii, No. 5, p. 357; also Experimente welche die Möglichkeit demonstrieren Läsionen der gastrischen Mucosa durch *X*-Strahlen sichtbar zu machen, *ibid.*, p. 360; also Demonstration des Magengeschwürs beim Menschen mittelst der Bismuth Subnitricum und *X*-Strahlen Methode, *ibid.*, p. 362, 1906).

Since then I have added nothing new to the first method, for all later advancement has consisted in the improve-

ment of apparatus—unless one is willing to accept as an advancement the use of calcium carbonate and calcium phosphate or of aluminum silicate instead of bismuth salts as first used by me. Leading German, Austrian and French clinicians have in the friendliest terms conceded to my clinic the historic priority of the methods of special radiology mentioned in the preceding. Furthermore, in the German article of July, 1906, (*Arch. f. Verdauungskr.*, xii, p. 363), I pointed out that the method was useful in the diagnosis of carcinoma of the stomach but that it had failed in two cases of cholelithiasis in which the gall-stones were later removed at operation.

Prof. Harry Adler and Dr. Robert Bay have repeated my experimental and clinical work in gastric radiology and Dr. Adler published his first results, which are confirmatory, in THE JOURNAL ("The Diagnosis of Ulcer of the Stomach and Duodenum by the Roentgen Ray," Nov. 12, 1910, p. 1725). Adler in this article also reported a number of cases of duodenal ulcer recognized by radiology and found later at operation.

It has sometimes been erroneously stated that Jolasse preceded me in employing radiology for the diagnosis of gastric ulcer. A scrutiny of Jolasse's publication (*München. med. Wchnschr.*, 1907, No. 29) will clearly prove that it appeared more than a year after my contribution to the *Archiv für Verdauungskrankheiten* (July, 1906). The most recent German text-books on diseases of the stomach (Hans Elsner, "Lehrbuch der Magenkrankheiten," p. 286, and also the new edition of Boas) have stated correctly the chronologic sequence of this radiologic endeavor. Other publications by my associates are by Adler and Ashbury (Am. Roentgen Ray Soc., September, 1910; also Adler and Ashbury, *New York Med. Jour.*, Oct. 7, 1911).

JOHN C. HEMMETER, M.D., PHIL.D., LL.D., Baltimore.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

INFLUENCE OF POTASSIUM IODID ON THE WASSERMANN REACTION

To the Editor:—Does potassium iodid have any influence on the Wassermann reaction? The only literature which I have been able to find on this subject is a report by Reasoner, of the United States Army, and Matson, of Portland, Ore. (THE JOURNAL, June 17, 1911, p. 1804).

In running Wassermanns I have observed a frank negative often when clinical symptoms were strong for active constitutional syphilis, potassium iodid alone being used. I mean syphilis without cerebral or cord lesions. P. C. WEST, Seattle, Wash.

ANSWER.—In the reports referred to above, the medication which was followed by negative Wassermann reactions is described as "protiodid," and was, therefore, presumably a combination with mercury. It is of course well known that negative Wassermann reactions are met in early secondary syphilis, as well as in the parasyphilitic affections, such as tabes. It is generally accepted that the action of the iodids in syphilis depends on the promotion of absorption of connective tissue. The focus of infection thus becomes more accessible to the action of mercury. In some cases of syphilis with gumma in which a negative reaction was obtained, the use of iodids alone has been followed by the appearance of a positive reaction. In large doses, iodids have been found to have some antispirochetal action in experimental syphilis in apes (Neisser), but the dose required was equivalent to from 120 to 250 gm. in man. In general it seems unlikely that moderate doses of iodids alone would cause a negative seroreaction in the presence of symptoms of active syphilis, for even in those cases thoroughly treated with a course of mercury or mercury and iodids, a positive reaction is often obtained after all symptoms have disappeared.

In instances such as those cited in the query, the possibility of error in performing the test must also be considered. In addition to the many obvious sources of error, the giving of iodids might affect the test in the following way: When iodids are given to normal animals, there occurs a slight increase of complement in the serum (G. F. Dick). If the test were made with such a serum, containing excess of complement without previous heating and without proper controls, all the complement might not be fixed, but enough left free to complete the hemolytic system, thus giving a negative test with a positive serum. Such a combination seems possible, though in practice unlikely to occur.

HARMFUL EFFECTS FROM PYRAMIDON

To the Editor:—In New and Nonofficial Remedies I note that pyramidon is claimed to be devoid of harmful influences on blood, heart or kidney. Do you think it safe to prescribe it for migraine? Can you tell me how it relieves the headache if it is not a depressant? D. W. WELLS, M.D., Boston.

ANSWER.—Exceptional claims are made by the manufacturers for the safety of pyramidon. The literature contains some instances of collapse and alarming symptoms following the administration of this coal-tar product. For instance, there is in this issue a paper by Bechet on "An Extensive Case of Dermatitis Medicamentosa Following the Use of Midol (Pyramidon)." While these are insufficient to justify a condemnation of the remedy, they indicate the necessity for caution in its use as well as in the use of all remedies in this class. Consequently, the Council on Pharmacy and Chemistry, in preparing New and Nonofficial Remedies, has stated under the title of Acetphenetidin the general nature of these remedies with a caution as to their use, and under the specific articles a general reference is given to that caution by the statement "See Acetphenetidin." There is no doubt that the occasional use of an analgesic of this sort for the relief of headache, neuralgia, etc., is beneficial and safe. It is the habitual and uncautious use which must be condemned. We do not feel that there is a warrant for the positive statement that pyramidon is safer than other remedies of this class, although the manufacturers present considerable clinical evidence to sustain their position. Those using pyramidon, therefore, should watch carefully to determine its relative advantages or disadvantages. So far as we know, no satisfactory explanation of the analgesic action of these remedies has been offered.

Of interest in this connection is the article that appeared in the Propaganda for Reform Department of THE JOURNAL (August 10, p. 461), dealing with "Midol" and "Nurito." These two nostrums, which are widely advertised to the public as "headache cures," contain pyramidon as their essential constituent.

COMPLEMENT FIXATION AND VACCINE DIAGNOSIS OF GONORRHEA

To the Editor:—Please refer me to literature on the technic of the serum diagnosis of gonorrhea. D. G.

ANSWER.—Our correspondent's letter does not make it clear which method of diagnosis he refers to by the "serum diagnosis of gonorrhea," but following is a list of references which include articles on both the complement-deviation test and the vaccine test originated by Dr. Irons:

Teague, O., and Torrey, J. C.: Study of Gonococcus by Fixation of Complement, *Jour. Med. Research*, December, 1907; abstr. in THE JOURNAL, Jan. 25, 1908, p. 315.

Watabiki, T.: Complement Fixation in Gonorrheal Infections, *Jour. Infect. Dis.*, January, 1910; abstr. in THE JOURNAL, Feb. 12, 1910, p. 568.

Swinburne, G. K.: Complement-Fixation Test in Gonorrhea, *Arch. Diagnosis*, July, 1911.

Köhler, R.: Vaccine Diagnosis and Treatment in Gonorrhea, *Wien. klin. Wchnschr.*, Nov. 9, 1911.

Value of the Complement-Fixation Test in Gonorrhea, Queries and Minor Notes, THE JOURNAL, March 23, 1912, p. 881.

Irons, Ernest E.: A Cutaneous Reaction in Gonococcal Infections, THE JOURNAL, March 30, 1912, p. 931.

Gonorrheal Complement Fixation Reaction, abstract of a discussion, THE JOURNAL, April 27, 1912, p. 130.

Elsing, E. H.: Diagnostic Use of Gonococcus Vaccine for Gonorrheal Infections, *Med. Record*, June 1, 1912.

THE VIAVI FRAUD

To the Editor:—I have lately learned that some of my friends have been using a "patent medicine" called "Viavi" put up by Dr. Law of San Francisco. According to the statement of one it is a "sure cure" for cancer! She is taking it for that purpose. Thinking that you have made an analysis of the article I take the liberty of writing and asking you for information; besides, it may do something for one of the deluded ones.

EDWIN BLOOR, Wauwatosa, Wis.

ANSWER.—The Viavi fraud was exposed some time ago by the *California State Journal of Medicine*. This matter has been reprinted in pamphlet form by the American Medical Association; price 4 cents. The matter also appears in the book "Nostrums and Quackery."

SALVARSAN IN PREGNANCY

To the Editor:—Please give references or information regarding the administration of salvarsan to the pregnant syphilitic mother and its effects on the future offspring. O. D. P.

ANSWER.—In reviewing the results recorded in several other articles, Jeannin ("Des résultats donnés par le salvarsan en obstétrique," *Presse méd.*, Jan. 6, 1912) concludes that salvarsan has a good effect on syphilitic lesions in the mother and leads to no more serious results in the pregnant than in the non-pregnant. No case of abortion has been caused by it so far as known and as to premature birth, either with or without the previous death of the fetus, a definite answer cannot be given at present.

With reference to the question whether salvarsan may cause the death of the fetus *in utero*, Jeannin finds that three deaths have been reported among thirty-nine births, or 7.7 per cent. This fetal mortality is less than that occurring in syphilitic infants in which no treatment has been given. The infant may be free from syphilitic lesions; on the other hand, other cases have occurred in which the infants after salvarsan treatment of the mother before birth, have developed serious lesions a short time later. The number of cases so far investigated is insufficient to determine how much curative effect can be expected from antenatal treatment.

Among other articles on the subject are the following:

Girauld and Tissier: Arsénobenzol et grossesse, *Bull. Soc. d'obst. de Paris*, 1911, xiv, 101. Bar, P.: Quatre observations de femmes syphilitiques traitées par le salvarsan, ibid., Feb. 16, 1911.

Lemeland: Le salvarsan en obstétrique, *L'Obstétrique*, April, 1911, p. 441.

Jeanselme: Le salvarsan injecté à une mère en période d'allaitement; peut-il influencer la syphilis de son nourrisson? *Ann. de gynéc. et d'obst.*, July, 1911, p. 394.

HOW TO TELL WHEN SALVARSAN NEEDLE IS IN LUMEN OF VEIN

To the Editor:—Recently in administering salvarsan intravenously I observed a point which has helped me considerably and which I feel certain is not generally known. Having seen both arms infiltrated with our solutions, and veins thereby obscured and incisions made in difficult cases, I was greatly pleased to find an absolutely sure sign that my needle was in the lumen of the vein. The apparatus I have been using is about the same as was described in the last issue of the *Yale Medical Journal*, consisting of two irrigating-bottles originally devised for nasal irrigation, connected with a two-way glass stop-cock by 6 inches of rubber tubing; about 4 feet more of rubber tubing; a couple of pieces of glass tubing inserted to permit observation for air bubbles, and then the barrel of a small Luer syringe onto which fits the Schreiber needle. Fitting the Luer syringe onto the needle is the important point. As soon as the needle enters the lumen of the vein which has been distended by constriction, the blood flows in a good stream back into the syringe. Then it is safe to allow the salvarsan to flow without first testing with saline and the latter is used only to wash out the last of the drug from the tubing. This flow of blood takes place because of the elastic walls between our shut-off and the needle and the greater pressure within the veins than within the rubber tubing. J. F. O'BRIEN, M.D., Meriden, Conn.

COMMENT.—The flow of blood through the needle has been made the test as to whether the needle is in the vein by Weintraud, as described by Montgomery (THE JOURNAL, Feb. 18, 1911, p. 501). Boehm objects to allowing blood to flow through the needle, fearing the clotting (THE JOURNAL, March 11, 1911, p. 732).

POSTGRADUATE WORK ABROAD

To the Editor:—I am planning a course in surgery, probably in Vienna. Please give me information in regard to clinics, method of procedure, courses, cost, conditions of living, etc.

E. L. GARNER, M.D., Welland, Ont.

ANSWER.—THE JOURNAL, April 8, 1911, contained about a page and a half devoted to graduate work in the hospitals and clinics of England, Berlin, Paris and Vienna, giving the addresses of men from whom further information could be obtained, and citing a number of articles which had appeared in the literature. The following additional articles may be of interest:

Kutner, R.: Postgraduate Medical Instruction, Its Present Status and Future Objects, *Post-Graduate*, March, 1910.

McMorrow, F.: Postgraduate Work for Americans at Budapest, THE JOURNAL, July 29, 1911, p. 407.

Paling, Albert: A Long Vacation, *West. Canada Med. Jour.*, November, 1911.

Leavitt, F.: Rambles Through Hospitals Abroad, *St. Paul Med. Jour.*, October, 1911.

Cole, G. L.: European Observations, *South. Cal. Pract.*, February, 1912.

Beck, Carl: Surgery of To-Day in Germany, Austria and France, *Surg., Gynec. and Obst.*, March, 1912.

McMorrow, F.: Postgraduate Work in Vienna and Budapest, *New York Med. Jour.*, March 30, 1912.

HEXAMETHYLENAMIN AS A URINARY ANTISEPTIC

To the Editor:—In THE JOURNAL, April 20, 1912, under "Therapeutics," you describe hexamethylenamin and state that "part of the drug is excreted unchanged, but during the course of its excretion, under the influence of acids or acid salts, a large part is decomposed and formaldehyd liberated."

Now, if this is so, why should not a drug be given to acidify the urine in those cases in which its beneficial effect is supposed to be exerted on the genito-urinary tract? I have in mind a case in which the urine remained alkaline after several days of persistent use of the drug. I can find nothing in the literature which takes up this point. WILLIAM CAIN, M.D., Birmingham, Ala.

ANSWER.—Our correspondent will find in THE JOURNAL, July 6, 1912, p. 38, an editorial discussion of some of the conditions which modify or limit the successful use of hexamethylenamin as a urinary antiseptic. The drug owes its efficiency in this respect to the formation of formaldehyd. In an alkaline urine none is formed and in consequence the antiseptic action is *nil*. In neutral or faintly acid urines a small amount, probably not exceeding 1 per cent., according to Jordan (*Biochem. Jour.*, 1911, v, 274), is split up and the action is feeble. The percentage of formaldehyd, and with it the antiseptic power, increases with the acidity. When the latter reaches a degree slightly above normal no organism will grow in the urine, which therefore remains indefinitely sterile. There is reason to believe that at this point about 10 per cent. of the hexamethylenamin has been converted into formaldehyd. The process of conversion into formaldehyd is a simple chemical one, which occurs in all solutions of hexamethylenamin under conditions of dilution, temperature, acidity and time which are identical with those obtaining in the body.

The acidity of the urine can be raised by administration of acid sodium phosphate, NaH_2PO_4. This is not the salt commonly employed as a mild laxative, the latter being the dibasic phosphate Na_2HPO_4. Various circumstances which cannot be enumerated here must limit the possibility of administering such a salt along with the hexamethylenamin. A dose of 30 grains three times a day of the acid phosphate along with 10 grains of the drug has been found to produce a urine that remained practically sterile on standing a few days.

LITERATURE ON SALVARSAN

To the Editor:—I am using salvarsan and wish to read more articles on the subject. Would it be too much to ask you to send me a list of the articles, editorials, etc., which have appeared in THE JOURNAL? C. R. T.

ANSWER.—In THE JOURNAL, Jan. 20, 1912, p. 216, in Queries and Minor Notes, we gave a list of articles on the subject which had appeared in THE JOURNAL since Oct. 1, 1910. The following have appeared since January:

Friedlander, A.: Salvarsan in Pernicious Anemia, THE JOURNAL, Feb. 10, 1912, p. 406.

Nichols, H. J.: The Present Status of Salvarsan Therapy in Syphilis, THE JOURNAL, March 2, 1912, p. 603.

Trowbridge, E. H.: Subcutaneous Injections of Salvarsan in General Paresis, THE JOURNAL, March 2, 1912, p. 609.

Longley, J. R.: Syphilis, Diabetes and Salvarsan, THE JOURNAL, April 20, 1912, p. 1194.

Cranston, W. J.: Salvarsan in Pellagra, THE JOURNAL, May 18, 1912, p. 1509.

Collins, Joseph, and Armour, Robert G.: The Treatment of Syphilitic Diseases of the Nervous System by Salvarsan, THE JOURNAL, June 22, 1912, p. 1918.

Levin, Harold J.: Salvarsan in Pregnancy, THE JOURNAL, Aug. 24, 1912, p. 622.

Suggett, O. L.: New Simple Apparatus for Intravenous Administration of Salvarsan with Saline Solution Preceding and Following, THE JOURNAL, Aug. 10, 1912, p. 440.

PREFERABLE METHOD OF GIVING SALVARSAN

To the Editor:—1. All things considered, which is preferable, the intravenous or intramuscular administration of salvarsan? Is the intramuscular administration of salvarsan as little liable to damage the patient as any other method of administration?

2. Is it true that the most eminent syphilogists of Chicago and other large medical centers are administering salvarsan by the intravenous method in an ordinary consultation office? M. E. L.

ANSWER.—1. The intravenous injection of salvarsan is regarded as the more efficient. When none of the solution escapes into the tissue around the vein the method is not followed by the inflammatory complications of the intramuscular injection. On the other hand, the intravenous method is more likely to cause toxic symptoms and more deaths have occurred from it.

2. Some practitioners give intravenous injections of salvarsan in their offices, but it is questionable whether this is wise, in view of the occasional untoward results. See the editorial on salvarsan in this issue.

Society Proceedings

COMING MEETINGS

American Association of Railway Surgeons, Chicago, Oct. 16-18.
Clinical Cong. of Surgeons of North America, New York, Nov. 11-16.
Delaware State Medical Society, Wilmington, Oct. 8.
Indiana State Medical Association, Indianapolis, Oct. 9-11.
Kentucky State Medical Association, Louisville, Oct. 29-31.
Medical Association of the Southwest, Hot Springs, Ark., Oct. 8-10.
Mississippi Valley Medical Association, Chicago, Oct. 22-24.
Nevada State Medical Association, Reno, Oct. 8-10.
Southern Medical Association, Jacksonville, Fla., Nov. 12-14.
Vermont State Medical Society, Montpelier, Oct. 10-11.
Virginia Medical Society, Norfolk, Oct. 22-25.

INTERNATIONAL CONGRESS ON HYGIENE AND DEMOGRAPHY

Fifteenth Meeting, held at Washington, D. C., Sept. 23-28, 1912

(Continued from page 1209)

THE EXHIBIT

Under the able direction of Dr. J. W. Schereschewsky, of the U. S. Public Health Service, the exhibition, which contained thousands of exhibits showing the public health work of various states and cities of the Union, was opened September 16 and continued until October 4. About 5,000 persons attended the opening. The exhibit was divided into thirteen sections. In the child hygiene section the visitor found a series of photographs illustrating the physical defects which lead to mental deficiency in children. Here also was shown a model child's hospital, and experts were in charge to describe the proper care of the child in the different stages of the various diseases of children.

In the industrial section were shown maps and lantern slides illustrating the work being done by the health welfare departments of great industrial corporations. In the sex hygiene section were two Washington exhibits. The first exhibit was from the United States Army Museum, and the other by Dr. Elnora C. Folkmar of the Woman's Clinic. This exhibit consisted of 200 beautiful lantern-slides showing how to teach children the story of the origin of life in plants, fishes, insects, birds, animals and man.

In the section on mental hygiene there were photographs illustrating forms of insanity. In other sections the importance of pure water, wholesome food and the disposal of sewage were strikingly illustrated.

In connection with the school section the department of education showed a number of model schoolhouses of pasteboard for rural districts.

In the section devoted to the communicable diseases the American Medical Association presented a strong exhibit against "patent medicines," showing some of the features of its Propaganda for Reform Department.

A section devoted to the hygiene of physical exercise was illustrated by photographs.

In the naval hygiene section a hospital room in a modern American battleship was rigged up to illustrate how the sailors on United States war-ships are cared for.

In the state and municipal section every state and practically all of the large cities of the country had prepared exhibits in the fight against diseases. Trinity Church, New York, had a unique exhibit showing model tenement buildings which give the greatest health and comfort possible to tenants. The exhibit was said to be a model of the 366 tenement buildings owned by the church, housing 882 families.

A single electric light was used to illustrate the death-rate among the infants of the world. Every ten seconds the light flashed, indicating, according to the statistical board accompanying the light, that an infant under the age of 1 year had died somewhere in the civilized world. This light indicated that 8,640 infants die every twenty-four hours.

STARTING RIGHT

Besides the various moving pictures showing the public-health work in various sections of the country, lectures were given by prominent physicians and hygienists. This exhibit was one of the most interesting, instructive and attractive features of the congress.

THE FINAL GENERAL MEETING

The final general meeting of the congress was held Saturday morning, September 28, at 9:30, and was called to order by President Walcott.

With the adoption of a series of resolutions, all bearing on important phases of hygiene, national and international, followed by brief expressions of thanks and appreciation from the delegates of the foreign nations represented at the meeting, the Fifteenth International Congress on Hygiene and Demography passed into history.

Dr. John S. Fulton, secretary-general, called on the delegates from the thirty-three nations represented. Official representatives of the following governments briefly expressed their thanks for the hospitality accorded them in the United States and their appreciation of what has been accomplished at this congress: Hungary, Brazil, Cuba, Denmark, France, Germany, Great Britain, Italy, Japan, Mexico, the Netherlands, Norway, Russia, Spain, Sweden, Venezuela, Bolivia, Greece and Australia.

President Walcott read the following resolutions, submitted by the Permanent International Commission of the Congress on Hygiene and Demography, which were adopted:

1. *Resolved*, That the congress approves the proposal made by the Section on Microbiology and Applied Parasitology that an international committee be appointed to consider the methods of investigation, classification and differentiation of the organisms of the colon typhoid group, with a view of securing greater uniformity in such methods and of adopting a provisional standard of certain tests which shall be recommended for the investigation of organisms belonging to this group.

2. *Resolved*, That for the important object of securing the highest degree of practicability in the notification, tabulation and analysis of the official returns of occupational diseases it is recommended that such notification and returns shall be made in a uniform manner by international agreement.

3. *Resolved*, That such nations and states as do not as yet provide for compulsory notification of occupational diseases be urgently requested to do so at the earliest possible opportunity.

4. WHEREAS, The medical departments of the several navies of the world have no uniform methods of expressing morbidity and mortality statistics and no uniform nomenclature for the causes of disability or any compilation and tabulation of returns; and

WHEREAS, The international classification of causes of death and sickness should form a basis for securing uniformity in all naval vital statistics; therefore be it

Resolved, That the secretary-general of the Fifteenth Congress on Hygiene and Demography is directed to communicate with the governments of France, Russia, Great Britain, Japan, the United States and such other nations as publish naval medical returns. That it is the sense of the congress that each navy should designate naval medical representatives to confer and recommend uniform methods and tables for expressing international naval vital statistics.

5. *Resolved*, The congress desires that in every country statistics of births, deaths, marriages and divorces be published periodically and, if practicable, annually. The congress believes that states or large cities which publish demographic statistics need registrars or similar officers sufficiently trained in medicine and demography to interpret demographic statistics, especially those of the causes of death.

6. *Resolved*, The congress believes that provision for the training, opportunity and appointment and retention of such men is of fundamental importance to public health work.

7. *Resolved*, The congress desires that family statistics, including both of children born and living, be gathered periodically in connection with the census.

8. *Resolved*, The congress desires, in connection with the registration of births, information giving the order of births in families. The congress desires, further, that in every country these statistics be published periodically and, if possible, annually.

9. *Resolved*, The congress desires that a commission be appointed to report on the subject of uniformity in criminal statistics, and especially uniform nomenclature.

10. *Resolved*, The congress desires that the International Statistical Institute, at its meeting to be held in Vienna in 1913, be invited to cooperate in the examination of this subject. Furthermore, the congress urgently desires that all demographers of the several countries pay special attention to mortality statistics.

11. *Resolved*, That the Fifteenth International Congress on Hygiene and Demography instruct the permanent international commission to take all necessary steps for the creation of a permanent bureau for these international congresses in the future.

12. *Resolved*, That the disinfectants used in different countries should be controlled by a simple bacterial test, capable of being easily effected, and that a committee from this congress confer with the committee of the International Congress on Applied Chemistry to define such tests.

13. *Resolved*, That the permanent international commission be requested to appoint a committee of not less than five members to represent this congress for that purpose.

Invitations were extended from Brazil, San Francisco and from the Russian delegation, each asking for the next congress. The next place of meeting will be announced later.

Before declaring the congress adjourned, President Walcott thanked the participants for their interest and emphasized the importance to Americans of having been brought into contact with the great men of the world in hygiene.

CONTINUATION OF THE SCIENTIFIC PROCEEDINGS

In addition to the papers abstracted in THE JOURNAL last week, papers were read at the meeting on the following subjects:

The Social Diseases and Their Effects On the Community

DR. HOWARD A. KELLY, Baltimore: White slavery is the worst plague spot on the social body to-day. It is a worse scourge than cancer and all infectious diseases put together. In money it costs America three billion dollars a year. In shortened lives, ruined homes and blasted careers the loss occasioned by this scourge simply cannot be estimated. Where white slavery flourishes, all forms of aberrant vice, the contamination of public officials, and to some extent the breakdown of our system of law and justice are found. All classes profit from this vice, and its effects are likewise observable in all classes; not less than 500 new-born infants die of social diseases in Baltimore every year, as a result of the transgressions of their parents. The same proportion exists in Washington as in Baltimore, and all over the world conditions are the same. As a result of years of investigation into this problem, I have arrived at some definite conclusions regarding the cause of white slavery. It is not due to the inherent profligacy of women. In fact, the white slave, who is nearly always coaxed, dragged or cajoled into her life of shame, is really the poor suffering victim of our civilization. Neither is the man altogether at fault who lives off the earnings of those women, nor does the fault lie altogether with the keepers of the white slave dens or with the public officials and judges who wink at their existence, contaminated though the latter are in many large stations. All this vice is a reflex of social conditions—of poor housing and poor wages. In Baltimore we find that as many as 80 per cent. of the women employees in department stores receive less than a living wage; but even this circumstance is not the fundamental cause of white slavery. I am absolutely convinced that the fault for this traffic in women lies with the people at large. More than to anything else, it is due to the indifference of the public and the churches. The evil could be definitely eradicated by men and women of high character going into the crusade against white slavery as a life-work. The problem should be attacked simultaneously from all sides and at all times. This is church work, and unless the churches take hold it cannot be done. Social workers must drive the church out of its comfortable club-like rooms, and—let me not be misunderstood—out of its miserable self-contentment and its anthems. The church must be recalled to its real work among the poor of the city and then we must all join hands together—the churchman, the scientist and the social worker—when purity of our civic life will be assured.

DISCUSSION

DR. WILLIAM H. WELCH, Baltimore, presented a resolution of thanks and gratitude to Dr. Prince A. Morrow, New York, for his pioneer work in fighting white slavery, which was passed by the Section.

PROF. M. A. BIGELOW, Columbia University: Sex education will not enforce universal morality in conformity with our accepted code, but it will help in many decisive battles with sex instinct. To all those who see nothing in the movement because it will not solve all the sex problems which have created a demand for special instruction, we may reply by simply pointing to the effect that general education makes some more efficient and better citizens, but many times fails to give the desired result.

DR. CHARLES B. DAVENPORT, Cold Spring Harbor, N. Y., in discussing social application of modern principles of heredity, emphasized the need of stopping the reproduction of the unfit.

MR. HENRY H. GODDARD, New Jersey, declared that there are definite limits to the achievement of sex education in the school. We may teach sex hygiene ever so well, but there are likely to be in any school one or two boys or girls who cannot be reached by teaching, and who will do far more harm to a hundred others than all the lecturing on sex education can ever achieve.

American Hookworm

DR. CHARLES WARDELL STILES and DR. W. L. ALTMAN, Washington, D. C.: We have examined and studied 12,980 hookworms passed in 102 cases of infection with *Uncinaria americana* with a view to testing Leichtenstern's suggestion that a determination of the proportion of males and females passed during treatment gives a practical indication of the completeness or incompleteness of the cure. Without denying Leichtenstern's view, as applied to *Ankylostoma duodenale*, we conclude that it does not apply to infection with *Uncinaria americana*, and therefore does not offer an additional practical factor in hookworm eradication in the United States.

Etiology of Poliomyelitis and Prophylactic Remedies

DR. NETTER, Paris, France: Poliomyelitis has not occurred as frequently in France as in the Scandinavian Peninsula, the United States, Germany and Austria. Cases occurred with anomalous frequency in 1893 and 1898 before the appearance of an epidemic in 1905 and 1910. We have noticed that in France as well as in other countries several cases occurred in the same family, in the same house and in houses adjoining each other. We have been able to prove that schools play some part in the spreading of this disease; also that it is transmitted by healthy people coming in contact with a person afflicted with it. We were among the first to employ the neutralizing qualities of the serum obtained from old patients, to ascertain the specific nature of attenuated forms and confirm the fact that sporadic classic infantile paralysis was identical with epidemic poliomyelitis.

Experimental pathology taught us the part played by nasal and buccopharyngeal secretions in the propagation of poliomyelitis. Kling, Wernstedt and Patterson have confirmed undisputably the virulence of these secretions as well as the intestinal contents, whereas Osgood and Simon Flexner proved the persistency of these virulent agencies in the throat and upper part of the nose even after the patient had recovered. If we add to these theories those of resistance of contagion to desiccation and also the possibility of its being transmitted by flies, we have all the essential data we need about prophylaxis.

The point that appears to interest us most specially is the study of the conditions as to how the disease makes its presence felt, whether in an isolated (sporadic) form or in a pronounced expansive (epidemic) form. In the same country, we find divergencies of 0.91 per cent. (Paris and surrounding country) to 11.76 per cent. (Yonne and Aube); 28.08 per cent. (Vienna) and 38.2 per cent. (Upper Austria); 7.7 per cent. (Devonshire and Cornwall) and 78.5 per cent. (Stokes River). This difference in diffusion should be attributed to a difference of virulence of the pathogenic agency. The proof of the virulent character of the products of human secretion furnished almost exclusively in Sweden in 1911, could not be verified in France nor America.

The appearance of cerebrospinal meningitis in 1909 and 1910 in France in the neighborhood of Paris was preceded by a small epidemic in 1898 and at this time we found this latter succeeded by an abnormal prevalence of poliomyelitis.

Epidemic Poliomyelitis in Norway

DR. FRANCIS HARBITZ, Christiania: Acute poliomyelitis has been known in Norway for not quite a century, the first cases having been described in 1820. Epidemics occurred from time to time, and in 1905 an epidemic broke out with 952 cases and a mortality of 10 per cent. The next year, 1906, the disease again came to an outbreak with 466 cases and with the same percentage of mortality. During the years 1907-1910 only a few sporadic cases and small groups of cases occurred. In 1911, however, the epidemic character of the disease again was in evidence; it ravaged large tracts of the country and also districts where it never before had been known. There were this year about 1,250 cases with a mortality of 8 to 10 per cent.

The outbreak occurs at times suddenly and simultaneously in several districts. It frequently happens that the epidemic starts with cases here and there and to all appearances not connected with each other. At times it is evident that the disease starts from a local point and spreads following the lines of communication as the highways, railroads, along the coasts and fjords, by way of steamers and boats. This mode of infection is clearly by outbreaks in isolated sparsely inhabited places. Again, comparatively small epidemics have had their starting point from a school, a country-store, public meetings, weddings, etc., or can be traced to tramps, gypsies who have passed through the district, and lastly it has occurred as local house epidemics. Measures to be taken consist of (1) immediate notification to the board of every case, abortive cases included; (2) isolation of the sick; (3) careful disposition of the patients' excretions and secretions, particularly from mouth and throat; (4) thorough disinfection after termination of the disease; (5) particular attention to the lighter abortive cases and to the possibility of the disease being carried through the intermediary of healthy persons.

Sanitary Measures for Poliomyelitis

DR. KARL LANDSTEINER, Vienna: The following measures should be carried out: Obligatory report of cases to the board of health; isolation of the sick persons, as far as it is possible; restriction of social intercourse, especially of those pupils who are in close contact with those afflicted with the disease; disinfection of the secretions and of the stools. As the virus has been detected in the dust of the homes of such sick people, special stress must be laid on the disinfection of homes, apartments, etc. It is advisable at times of epidemics to pay special attention to the inflammatory affections in the region of the nose; an antiseptic treatment of this region is probably very useful.

Poliomyelitis, Etiology and Mode of Transmission

PROF. AXEL HOLST, Christiania, Norway: In 1898 Harbitz examined three cases of poliomyelitis and expressed the opinion that they were due to a virus entering from the throat and intestines. In 1911, there were 1,450 cases among a population numbering only two millions and a half. The death-rate ranged from 10 to 20 per cent.; 75 per cent. of the cases were in children, and 25 per cent. in adults. We see in Norway abortive cases. One family consisting of nine members, husband, wife, sister, nurse and five children, was attacked with this disease in two weeks, one case following the other in rapid succession. Seven cases were abortive. The symptoms were stiffness of the neck and limbs, some diarrhea, vomiting and some fever. Most of the cases occur in country districts, and often in sparsely populated districts. Comparatively few cases occur in the crowded quarters of a town or city. We isolate all notified cases in Norway. Since 1860 we have had a law of compulsory notification of this disease which is strictly enforced.

DR. SIMON FLEXNER, New York City: The question, I believe, is still an open one as to the precise manner in which the distribution of the virus takes place. It does not necessarily follow that the virus takes any one course of introduction into the body of a human being. It is proved it can go into the body of animals very rapidly through the upper respiratory tract. It can be introduced by direct or indirect inoculation into the blood, and that this is a less certain means of producing infection than that of direct inoculation on the mucous membrane. Still, we must remember that monkeys are relatively insusceptible animals to this disease, which is peculiarly a disease of human beings; that human beings are relatively susceptible as individuals. It is not a disease that attacks everybody right and left during any epidemic, but it takes and chooses usually children, and children of very tender age, and usually one or two in a group, but sometimes many, so that there must exist many individuals who are highly susceptible to the disease. On the other hand, a large number of people are insusceptible to the disease which is the chief means at present of preventing its wide spread. I am convinced that with such knowledge as we now have it is imperative that strict measures of isolation be carried out in cases of this disease and with those persons who come in direct relation with these patients.

Transmission of Poliomyelitis

PROF. ALFRED PETTERSSON, Stockholm, Sweden: Large amounts of the virus of poliomyelitis were found by me in the secretions from the mucous membrane of the nose, pharynx, trachea and intestines. In the acute cases there was distinct paralysis, as well as in some of the abortive cases, and even in healthy persons in the neighborhood there were a few cases with paralysis. I was able to demonstrate the virus of the disease by inoculating monkeys. There is nothing against the hypothesis that epidemics are spread by direct or indirect transmission of the virus from person to person. However, there is a good deal against the supposition of the transmission of the virus by insects to such a degree as to cause epidemics of the disease. The epidemics of poliomyelitis in Sweden show no connection with the changes of season and insect life.

DR. MARK W. RICHARDSON, Secretary State Board of Health, Boston: The disease is less transmissible than typhoid, scarlet fever and diphtheria. The disease is distinctly one of suburban or rural communities rather than cities. This observation is

based on 2,138 cases. Country children are exposed very much more strongly to the disease than the children of cities, for the reason that country children are more subject to the bites of insects than city children and may become infected in that way. In the homes of eighty-eight patients in seventeen cities and towns ordinarily stable flies were present in or about the house of every infected individual. Experiments were made on monkeys with the bites of these flies, with the result that during the first year the experiments were negative. In 1912 similar experiments were repeated with greater success. There were a number of cases in which patients suffered from a second attack of the disease months or even years after the first attack. Between attacks these individuals may be persistent carriers of the disease and be responsible for the development of cases in other people. Hexamethylenamin is used as a prophylactic measure with very good results. One boy in a school developed the disease, and to the other pupils hexamethylenamin was administered, with the result that no other case of the disease developed. Functional recovery occurs in 25 per cent. of the cases examined at the end of four years. Herpes zoster may be due in some instances to the virus of poliomyelitis.

DR. M. J. ROSENAU, Boston: In reference to the transmission of poliomyelitis by the biting fly, we were led to focus our attention on this biting fly (*Stomoxys calcitrans*) as an intermediate host in the tranamission of a particular infection referred to by Dr. Richardson. When I first began to study the disease, I regarded it probably as one which is spread by direct contagion, by contact, either directly or indirectly, from person to person. The first circumstance which shook my faith that we were dealing with a contagious disease was the fact that we had eighteen negative results in attempting to prove the presence of the virus in the secretions from the nose and throat. I could not help asking at the time if it were not possible to find this virus, which is so potent, in the secretions of the nose and throat of persons who have the disease and those who are convalescing from the disease. These results were confirmed at the same time by Strauss, of New York, who had negative results in a longer series and by Newstaedter's recent results and by other results, all of the examinations having proven negative excepting the one recently reported by Kling, Patterson, and his associate at this congress, and in the literature recently.

A second circumstance which led me to believe we were not dealing with a contagious disease was the fact brought out by Dr. Richardson. Children in all stages of this disease were crowded into schools, institutions, tenement districts and other places where there was every chance for the spread of the disease, but it did not spread there, but it continued to spread in the rural, thinly scattered districts where one would not expect to find contagious disease. There was a resemblance to rabies. All those who have worked with this virus in laboratories were at once struck with the resemblance between poliomyelitis and rabies. The latter being a wound infection, there is some analogy between it and poliomyelitis, and poliomyelitis might be transmitted through some sort of wound. I was fortunate enough to have had experience with yellow fever, both in the investigation of it and with sanitary measures against it, before the mosquito period, and I was much struck with many analogies which came to me between that disease and certain features of poliomyelitis.

The work I bring to your attention consisted of taking a number of flies—*Stomoxys calcitrans*—caught in a net and bred for the purpose. You can catch several hundred of these flies in a stable in a very short time. We placed these flies in a large cage and exposed monkeys to their bites, the monkeys having been purposely infected with the virus of poliomyelitis. Care was taken to place the monkeys in the cages in all stages of the disease, before and after. In fact, a monkey would be exposed to the bites of the flies on the same day he was infected, so that the flies could drink the blood of the monkey during all stages of the period of incubation of the disease, for we do not yet know in what stage of the infection the virus appears in the blood at its maximum, or the best period for infecting these flies. Following this we exposed healthy monkeys to the bites of the same flies, and after several weeks' time these healthy monkeys came down with a disease which in all essential respects resembles anterior poliomyelitis. Out of twelve healthy monkeys so exposed, six of them now have symptoms of the disease, three of them in the virulent form. Of the other three monkeys, two are coming down, but one seems to have a milder infection than the other. This mild infection consists of trembling and weakness of the hand, and some weakness of the jaw which lasted about a week or so and then passed away. We cannot be sure whether that is true poliomyelitis or not until we are able to test the monkey subsequently. If it were poliomyelitis, that monkey will be immune. In three of the six cases that came down with the disease, having been bitten by flies, there was some diarrhea. The disease in the monkey resembles more closely that which we see in children rather than the disease we produce purposely experimentally by bringing the virus in direct association with the central nervous system. Of course, that may be only a coincidence, but it is interesting.

These stable flies exist everywhere. They are more common in the country districts than in city districts. They are vicious and voracious. When they are hungry they can go through the skin of the back of a horse or a cow. They can go through a woolen garment such as is worn and bite in that way. This fly leads a life very much like the common house fly, but contrary to the common house fly, it is a rather wild or semi-domesticated insect. This fly does not enter houses so much by preference, but is found more especially on the outside, around stables, etc., but sometimes it comes into the house.

The method by which these experiments are carried on is of some importance for those who would like to repeat them in order to corroborate or disprove the results that we have obtained. The method is very important in order to get the results. I am not quite sure whether the disease is conveyed by the bite of a single fly or not, because all the monkeys exposed have been bitten by a number of flies. A point of importance in conducting these experiments is that the flies should be let alone. They should not be taken from the first infected monkey and conveyed to bite a healthy monkey. But the monkeys should be handled. The flies do not stand handling so well. They do not like to be in a cage. The cage should be large and roomy. This cage is three or four feet from the ground, so that the flies do not injure each other in flying as they would do in small cages. They need nothing else than blood which they should have every day or two. If given blood they will not visit the water. We have tempted them with all sorts of fruits, but they do not seem to take anything but blood. These flies breathe in organic matter from manure, rubbish and even the soil, and resemble more or less the tsetse fly.

I have purposely refrained from drawing any conclusions. It is clear we have had infection which has been transmitted through the agency of these flies from monkey to monkey. It requires several weeks before the fly is able to infect every monkey so far as we are able to tell at the present time. What reference this has to the human cases I am not able to say. If I were a health officer of a community and poliomyelitis prevailed, I should institute a fly campaign.

PROF. GEORGE H. NUTTALL, Cambridge, England: Dr. Rosenau's remarks are extremely striking, and I look forward with the greatest interest to the confirmation of these experiments. But we know how many pitfalls there are in connection with work of this kind, as pointed out in the work of the sleeping sickness commission, but Dr. Rosenau is very cautious in coming to conclusions. It looks very much as if he has proved his point. It will be interesting now to follow up the biology of this fly. I have been carrying on investigations for many years in connection with this fly as bearing on the transmission of other infections. It would be interesting to find out how this period of incubation is affected by temperature and how long it lasts.

With regard to the food of the fly, I have kept it alive for weeks, feeding it on blood, but have also fed it on grape juice. It will be interesting to note in connection with these experiments how the virus of poliomyelitis remains in an esophageal diverticulum and not in the alimentary canal. The experiments by Dr. Graham Smith in Cambridge tended to show that in some cases the flies feed on certain bacteria, which they retain

for a long time in their bodies, storing them in the esophageal diverticula. These flies in England are known as rain flies, because they come into houses after rain. I should like to know if there is any connection with the rains and this fly. During the rainy season with us in England these flies rush into houses, and I have observed this for the last fifteen years. It is quite a characteristic habit of these creatures, and it may have a definite bearing in relation to the incidence of the disease.

PROF. DR. LOEFFLER, Germany: There seems to be a difference of opinion on the part of those who have addressed the Congress in regard to the causal agent of poliomyelitis. Professor Pettersson says that the disease is transmitted by an agent which does not at all involve the fly, for the reason that cases of this disease come under his observation in the winter months when there are no flies. On the other hand, Dr. Rosenau has stated that he believes the disease is transmitted by flies, or, at any rate, he shows the possibility of the disease being transmitted by these insects. These differences of opinion need to be reconciled. They require solution.

DR. FRONCZAK, Buffalo: As Health Officer of the city of Buffalo, I will say that it has more cases of infantile paralysis than any other city except Los Angeles. Up to yesterday noon we have had 264 cases this year, of which 124 occurred in August, 71 in September, with 35 deaths. There are one or two theories we cannot reconcile. First, the theory of hot weather and dust. Last August was sub-normal, cold and rainy. As a matter of fact, there was not a single day during the entire month of August in which there was not either rain or cloudiness. It was the same in the early part of September. We have waged war on flies. For the last four or five weeks there have been twelve men in the city of Buffalo studying the disease. As to the fly theory, cases of poliomyelitis have occurred in sections of the state where there are no stables, and in August and the early part of September when the weather was sub-normal; it was chilly and rainy all the time, and there was no dust.

DR. WILLIAM S. THAYER, Baltimore: I should like to ask Dr. Rosenau if in his experiments he was able to form a definite opinion as to the incubation period of the disease in the six monkeys and as to the length of time the flies were kept before they were allowed to bite the monkeys. In the work which Dr. Pettersson has brought to our attention, I am rather struck with the similarity between the seasonal relations of this disease as set forth and the seasonal relations of malaria, a disease known to be transmitted by a blood-sucking insect. It is striking that in the first half of the year, from January to June, cases of poliomyelitis are extremely rare. They began in May, reaching the number of eighty-eight and in June eighty-three. In July the number of cases suddenly increased, and the number reached its height in August, September and October, falling off rapidly in the fall, although in November and December there are still a considerable number of cases. I must say, it is rather strikingly like the curve of malaria which we believe to be due to the bite of anopheles in temperate climates. Of course, it is conceivable that the incubation period both in the fly and in the human being may be longer in colder regions, and while it would be hardly prudent to attempt to argue in favor of a hypothesis, with regard to which we have only had a preliminary announcement, yet from the figures which have been presented we ought not to feel that it is not a possibility as yet, even in a cold climate.

DR. ROSENAU: When we began the work last summer we tried all sorts of mechanical and other devices to have the flies bite the monkeys without injuring them or the flies and this was not such an easy matter, as both are pretty lively. I will tell you a little trick which we have used, and which has served a good purpose, so that those who desire to repeat this experiment, may find it useful. We simply wrap the monkey up in a little piece of chicken wire, with a mesh about three-quarters of an inch, wrapping him tightly but not hurting him, so that he cannot move. Then you have him in a package and he cannot do a thing. Put him in the cage, the flies find him and in a little while the flies feed. When you think the monkey has been bitten enough, take him out without disturbing the flies. At first we had three or four monkeys exposed at the same time, and almost all the flies would select one particular monkey, so that other monkeys would escape being bitten, or only be bitten by a few flies. Noting that fact, we went slowly in our experiments, so that now we expose one monkey at a time. The fly picks up the infection on the mouth parts of one monkey and carries it to the healthy monkey, the same as you would transfer infection with a hypodermic syringe.

As to Dr. Thayer's question, I cannot answer it completely. I can only say that the shortest period which we can now give is about twenty-one days, as I remember it. I have not my notes with me. How much of that twenty-one days was in the extrinsic period of incubation in the fly and how much in the intrinsic period in the monkey, I am unable to say, but by analysis of the figures I may be able to learn more about it. That, as well as many other points, we hope to work out.

Dust and Fumes, The Foes of Industry

SIR THOMAS OLIVER, Newcastle, England: Mine owners have experimented in many ways to prevent the ignition of coal dust. I am convinced that the explosions in the mines are largely due to the absorption of oxygen by the coal dust. The explosions generally occur in the summer months, when a barometric change is likely to ignite the dust. I have found that the dust absorbs more oxygen in the dark, and also that dust sprinkled with water absorbs little less oxygen than the dry dust. Some of the dust was treated with a chemical agent and I found that it was practically non-absorbent as compared with coal dust in other forms. I congratulate Congress and the President on the passage of the act prohibiting the use of white phosphorus in the manufacture of matches, which led to a general phosphorus necrosis of the jaw bones of employees in match factories.

Accidents and Disease of Miners and Tunnel Workers

DR. WILHELM LINDEMANN, Bochum, Germany: Owing to the technical progress of mining, fatal accidents have been reduced. The actual number of accidents shows an increase which, however, is lower than the figures which the statistics give. The increase is mainly caused by the rapid development of mining and the consequent employment of unskilled laborers. The danger of accidents in mining demands that each mine be supplied with the necessary means for giving first aid and the establishment of central rescuing stations. Emphysema is due primarily to the hard labor in mining; technical progress in mining decreases this disease. Anthracosis is an inhalation disease; severe cases are prevented by the use of irrigation (spraying) methods, by the non-employment of children in mines, and by the beneficiary pension-system for the miners. The coal dust is no hindrance to the development of tuberculosis or carcinoma; it does not favor the development of acute pulmonary diseases. The number of rheumatic diseases is greatly exaggerated. The nystagmus of miners is the result of overwork and of the dazzling effect of the light on the eyes in mining; it does not prevent the miner from accurately recognizing on the benzine-safety lamp the proportion of fire damp in the atmosphere of the mine.

Injuries Caused by Electricity

SIR THOMAS OLIVER, Newcastle-on-Tyne, England: Contact with a live wire or an unprotected portion of machinery may kill a person immediately, it may injure him so severely that he dies a few hours afterward, or he is severely burned and recovers slowly. Death in electric shock resembles death caused by lightning. It is difficult to say what pressure electrical current or voltage is within the limits of safety. Of the two kinds of current the alternating is more dangerous than the constant, when the values are not too high. Currents of 100 to 150 volts are generally regarded as within the limits of safety, 200 to 300 as coming within the danger sphere and anything above 600 is likely to be fatal. There is no absolute certainty in this statement, however. Mode on contact, duration of contact and whether made with one or both poles, the condition of the skin at the time, e. g., moist or dry, state of boots a workman is wearing and whether the soil is moist or dry, are circumstances which

determine the consequences of exposure to electrical currents. The skin of the body offers resistance to the penetration of the current. When an electrical current penetrates the skin, none of its energy is lost; it is simply transformed into mechanical, thermal, chemical and electrolytic action. The injuries caused by electricity can hardly be regarded as burns, since they are not wholly due to extension from the surface but to internal heat. Prevost and Battelli of Geneva found that currents of low tension caused death by the heart becoming paralyzed; with currents of high tension the breathing is first arrested, the animal is killed outright by inhibition of the respiratory center. Grange is of the opinion that hemorrhage into the medulla oblongata causes death by pressing on the origin of the pneumogastric nerve. Jellinek found on lumbar puncture evidence of high cerebrospinal pressure in death after electric shock. In many experiments heart and respiration cease together, or respiration may be first arrested.

Industrial Plumbism

DR. ALICE HAMILTON, Chicago: A comparison between the lead trades in Europe and in the United States in respect to the dangers of industrial lead-poisoning among the working people brings to light many differences. Certain dangerous lead trades in Europe are not lead trades in the United States; for instance, file making, jewel polishing, the making of cheap kitchenware. A point in favor of the United States is the increasing use of lead substitutes. Anilin dyes are beginning to supplant chromate of lead in textiles, wall-papers, artificial flowers and paints; cut glass is usually finished with acid instead of lead powder; the sulphate of lead has largely taken the place of the basic carbonate in the manufacture of rubber, and is used more and more as a substitute for white lead in the manufacture of paints. These substitutions or adulterations may not always be creditable commercially, but they are an advantage to the workman.

All these advantages are more than offset by an ignorance of the hygiene of lead industries in the United States such as is not seen in any of the northern European countries, and an almost complete lack of legislative control. In the white and red lead industries, in paint grinding, coach and carriage painting, the making of storage batteries (electric accumulators) in the typographic trades, and in lead smelting, conditions are almost always more dangerous in factories in the United States than in Europe.

There is no legislation in the United States, except in Illinois, which obliges the employer to remove poisonous dust or to provide adequate equipment for personal cleanliness. The results of the admirable legislative control in Europe, on the one hand, and of the lack of legislative control in the United States, on the other, can be shown by statistics gathered in a few lead trades which have been intensively studied; viz., the making of white and red lead, of pottery, of glazed tiles and the porcelain enameling of sanitary ware.

Examination of Employees for Tuberculosis

DR. THEODORE B. SACHS, Chicago: Early detection of tuberculosis in an employee gives him the best chance of recovery, his co-workers the best chance of protection from infection, and the employer a working force free from the undermining influences of undetected sources of infection. A system of medical examination of employees in a working place is essential to early detection of tuberculosis in individual cases. The essentials of such a plan, in a general way, are as follows: (1) Examination of all employees at the time of their engagement and, later, at the time of illness or when indicated by suspicious symptoms; (2) institutional treatment of the majority of "open" and "active" cases of tuberculosis; (3) education of entire working force, particularly the "predisposed" in a régime of life tending to increase physical resistance; (4) employment of physician to examine the employees, to instruct the sick, the predisposed and those in average health, to instruct foremen and others in charge of employees in the recognition of suspicious symptoms; (5) employment of nurse to assist the physician, to study the home conditions and régime of employees, and to supervise the correction of the same under the direction of the physician.

Infant Mortality in Relation to Factory Labor

DR. GEORGE REID, Stafford, England: I conducted an inquiry for the Home Office Department of the English Government which, among other objects, had for its purpose the determination on a more acute basis of the effect, if any, of married women factory labor on the infantile mortality. The twelve months' life history of about 5,000 infants born in families of the artisan class in the pottery towns of North Staffordshire in 1908 was inquired into, with the result that the infantile mortality among the class of working mothers exceeded that of the domestic class by 43 per cent. Classifying the whole of the infants according to method of feeding, it was found that the mortality among those partly artificially fed exceeded that of the naturally fed class by 79 per cent., while the mortality among the wholly artificially fed showed an excess of 137 per cent.

Ventilation of the Steel Sleeping-Car

DR. THOMAS R. CROWDER, Chicago: The steel car has come into extensive use in this country. These cars are all ventilated by the exhaust method, and they have some minor changes of construction tending to increase the volumetric air supply. Following the method I employed in some previous work, a study of thirty-six cars has been made, involving the analysis of some 1,400 samples of air. The comparative results show that the volumetric air supply, as indicated by the CO_2 determinations, is actually somewhat increased over that of the older type of cars similarly equipped as to ventilating devices. It was determined that the older type of car, ventilated by the natural or deck sash method, receives an average of about 28,000 cubic feet of air per hour; the same car ventilated by the exhaust method about 41,000 cubic feet per hour; and that the steel car receives about 53,000 cubic feet per hour. The air supplies to the lower berth are, respectively, about 1,400, 2,000 and 2,200 cubic feet per hour; and to the upper berth, respectively, about 1,300, 1,900 and 2,000 cubic feet per hour. The air supply, under the influence of exhaust ventilation, finds its way in chiefly through crevices about doors and windows, and is very evenly distributed throughout the car.

Sanitation of Street Cars

MR. J. C. HALLECK, Newark, N. J.: Municipal authorities, in regulating their street railways, have shown a disposition to maintain comfortable rather than sanitary temperatures, with no provision for removing the heated air, after it becomes vitiated by an unusual crowding of the car.

Disinfection of Water-Supplies

PROFESSOR GAERTNER, University of Jena: The chlorin process of sterilizing water has three special advantages, namely, it is certain, rapid and economical.

(To be continued)

AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS

Twenty-Fifth Annual Meeting, held at Toledo, Ohio, Sept. 17-19, 1912

(Concluded from page 1212)

Indications and Technic in Gastric Resection and Gastro-Enterostomy

DR. GEORGE W. CRILE, Cleveland: My assistants and I have performed 420 operations for gastric and duodenal lesions. Of these, 208 were performed for cancer; 204 for benign obstructions and ulcers, and eight for traumatic perforations. Summarizing our experience, I can say that all duodenal ulcers are cured; congenital stenoses are cured; acute gastric ulcers treated by gastro-enterostomy in the lesser curvature and the cardia are often disappointing, but resection cures. In cancer the cures depend on the status of the lesion. Resection of gastric ulcer of the saddle type is not only safe, but the results are clinically good. Transfusion of blood in cases of hemorrhage; the mastery of the cobbler stitch in all parts of the operations; the performance

of shockless operations on the principle of anoci-association has now given an almost complete control over the operative results in gastric surgery.

Ileo-Sigmoidostomy for Colonic Stasis

DR. CHARLES L. BONIFIELD, Cincinnati: I have performed this operation in six cases, with one death. Judging from the very smooth recovery of the other five patients, this is not what the rate will be when the series of cases is larger. I believe that any other intra-abdominal operation would have led to that patient's death. In a comparatively small number of severe cases this operation will bring relief that cannot otherwise be obtained.

Early Operation for Fibroid Tumor of the Uterus

DR. RUFUS B. HALL, Cincinnati: The profession at large is prejudiced against early operations, and through it the patient and the patient's friends, thereby making it more difficult to get the consent of these patients for operation early in the disease. After a fair trial with palliative treatment for two or three months, if the symptoms subside and the patient is relieved and apparently a well woman, the case is not one for operation now, but should be carefully watched. On the contrary, if the symptoms continue after this preliminary treatment, and after making certain that they are due to the activity of the tumor, not that the tumor is enlarging rapidly or that secondary changes are taking place in it, but in the sense that it has not become quiescent, non-active, clinically well, and is pursuing the usual course in these cases, the patient should be operated on in the near future.

Potential Cancer of the Breast

DR. MILES F. PORTER, Fort Wayne, Ind.: Benign tumors and such pathologic changes in the breast as result from chronic inflammation, abnormal involution (fibrous and glandular hyperplasia with retention cysts), and trauma, are potentially cancerous. Actual cancer, as demonstrated by microscopic examinations, may be present without palpable tumor formation. The only way to differentiate between potential cancer and actual cancer is by microscopic examination. All potential cancers require excision, and all demonstrable cancers require radical removal.

Metrorrhagia Due to Atheroma of the Uterine Vessels

DR. ARTHUR THOMAS JONES, Providence, R. I.: Metrorrhagia is essentially a symptom of some pathologic condition, either general or local. One should determine the pathology, then apply treatment. The routine curetting of all cases, regardless of pathology, without the most careful examination of the scrapings, is to be deprecated. Many cases of suspected malignant disease are found on operation to be cases of sclerosis of the uterine vessels. Patients are usually nearing the climacteric, when we may be on the lookout for malignant diseases; or their general arterial system may give evidences of early arterial changes. That we do find definite changes with hardening of the uterine vessels both grossly and microscopically is a fact. That this change is, strictly speaking, a sclerosis rather than a true atheroma is shown by microscopic findings. Medication internally or topically is of no avail. Hysterectomy is the only rational treatment, and that should be performed as soon as the diagnosis is made and before the uterine vessels have become so brittle that ligating is unsafe.

Ureteral Injuries

DR. HERMAN E. HAYD, Buffalo: These injuries are of frequent occurrence, and particularly when operating through the vagina. These injuries often produce no symptoms until a late slough occurs, and then their presence is made known by urinary dribbling. Two courses are open to the surgeon, namely, early ureteral implantation into the bladder and nephrectomy.

A New Surgical Procedure for Retrodisplacement of the Uterus

DR. SAMUEL H. BUTEAU, Oakland, Cal.: The uterus is held in position by muscles, not by ligaments. These muscles correlate in function, and thus all are concerned in maintaining the uterus in the normal position. All must be considered in dealing with displacements. Treatment consists of correcting the causes, replacing the uterus, and giving rest to the muscles. Rest is best accomplished by an artificial round ligament of kangaroo tendon.

Conservative Operations on the Ovaries

DR. WILLIAM H. HUMISTON, Cleveland: Of 112 cases in which conservative operations have been performed, but seventy patients have been heard from; nineteen of these have given birth to twenty-one children. Only three have returned for a second operation. If a similar ratio of percentages of pregnancies occurred in those patients not heard from, it would increase the per cent. to about 28. In the 19 per cent. out of the 112 cases we have a showing that is convincing to a judicial mind that conservative operations are worthy of general adoption.

Stenosis of the Pylorus in Infancy

DR. JOHN W. KEEFE, Providence, R. I.: I would advocate in cases of pyloric spasm, after a fair trial of food regulation and resorting to other medical measures with no relief, opening the abdomen and relieving the spasm of the pylorus by making a small longitudinal incision through the peritoneal and muscular coats of the pylorus down to the mucosa and uniting the incision in a transverse direction. The medical measures that may be adopted in cases of pyloric stenosis are attention to the character of the food, the time of feeding and the quantity at each feeding, stomach lavage, opium, poultices to epigastrium, saline and nutrient enemas. Prolonged medical treatment increases our operative risk and we may lose valuable time. The chief cause of death may be attributed to delay in operating. Partial pylorotomy or pyloroplasty alone, or either aided by gradual dilatation with sounds passed through an opening in the stomach and the pylorus after the hypertrophied muscle has been incised, separated from the mucosa and a portion equal to about one-half of the circumference of the pylorus removed, should be the operation of choice. The results have been shown to be excellent and the parts are restored to practically normal condition.

The Selection of the Anesthetic for Abdominal and Pelvic Surgery

DR. ROLAND E. SKEEL, Cleveland: There is a form of mixed ether-nitrous oxid-oxygen anesthesia which gives the maximum of safety with the minimum of discomfort. The patient is first rendered unconscious with gas, as in the well-known gas-ether sequence, but instead of discontinuing the nitrous oxid it is continued, and a very small quantity of ether added to the nitrous oxid-oxygen mixture. By this method the danger of prolonged asphyxia at the outset is avoided while the very small amount of ether used is productive of no danger to the bronchi or kidneys and violent ether sickness is not frequently seen. Muscular rigidity is also avoided and the patient is saved the excruciating pain which follows pure gas and oxygen anesthesia since she dozes for some time after the anesthetic is discontinued, instead of awakening immediately as after gas alone.

Cesarean Section

DR. JOHN NORVAL BELL, Detroit: I discuss the points of interest in a series of seven cases. Is placenta prævia centralis an indication for abdominal cesarean section? I am firmly convinced that it is, believing that the dangers attendant on this operation are far overbalanced by perforation of the placenta, turning, and bringing down a leg, which is the routine procedure in these cases. The results were ideal in the seven cases, both mother and child making perfect recoveries. I would strongly advocate a more frequent adoption of this operation, and would include impacted face presentations among the indications.

DR. ASA B. DAVIS, New York, described the technic of the high median operation, and presented a summary of cases. He also reported a case of acute dilatation of the stomach following cesarean section.

Book Notices

SYPHILOLOGY AND VENEREAL DISEASE. By C. F. Marshall, M.D., M.Sc., F.R.C.S., Surgeon to the British Skin Hospital. Cloth. Second Edition. Price, 10 shillings, 6 pence net. Pp. 560. London: Baillière, Tindall & Cox, 8 Henrietta St., 1912.

While the title of this work would seem to indicate that it covers the whole subject of syphilis and the venereal diseases, it is really a treatise on syphilis, for of the 544 pages of text, 470 are given to syphilis and seventy-four to gonorrhea. The subject of chancroid is not considered, "venereal disease" apparently meaning gonorrhea and not comprehending the most venereal of all venereal diseases, the soft sore. The venereal diseases, therefore, aside from syphilis, are not adequately considered; but as a treatise on syphilis the work is entitled to high commendation. The author considers the subject from a broad point of view and successfully undertakes the exposition of syphilis as it occurs in all of the tissues of the body. The work is not simply a treatise on syphilis as a venereal and cutaneous disease, but covers thoroughly this disease in all of its manifestations. Indeed, if any criticism is to be made of the breadth of the author's treatment of the subject of syphilis it is that he has a tendency to attribute to it a wider influence in the causation of other diseases than is warranted by established facts.

From the point of view of clinical medicine the work is a delight, in the present day of laboratory guides to syphilis. It is written on the basis of a large clinical experience and is practical, sane and dependable, especially in the field, so uncertain to-day, of treatment. The recent additions to syphilis—the microbiology, serum diagnosis and arsenical treatment of syphilis—are taken up in three chapters at the end of the book, and they constitute, perhaps, its most satisfactory part. These subjects are given adequate and very satisfactory consideration. The author's wisdom and sanity particularly stand out in his estimation and statement of the values of serum diagnosis and arsenical treatment.

HANDBUCH DER SERUMTHERAPIE UND SERUMDIAGNOSTIK IN DER VETERINÄR-MEDIZIN. Herausgegeben von Dr. M. Klimmer und Dr. A. Wolff-Eisner. (Band 2 vom Handbuch der Serumtherapie.) Paper. Price, 18 marks. Pp. 495. Leipsic: Werner Klinkhardt, 1911.

Protective inoculations against animal diseases have received much attention and considerable progress can be noted. This book is probably the most exhaustive treatise on the subject. The various chapters are written by authors who rank high as experts.

The chapters on tuberculosis merit special mention. The diagnostic values of tuberculin preparations are discussed with conservatism, and attention is given to combating the disease by protective inoculation and appropriate legislation. The following diseases of animals are subjects for the chapters: hog cholera, pleuropneumonia of hogs, hog erysipelas, anthrax, symptomatic anthrax, foot-and-mouth disease, diseases of calves, contagious abortion of cattle, fowl cholera, distemper of dogs, braxy, pleuropneumonia of cattle, cattle fever of South Africa, glanders, rabies and African horse disease. In addition the theories of immunity, on which protective inoculations are based, are discussed, including agglutination, precipitation, complement fixation, and hypersusceptibility. Finally methods of exterminating mice and rats by bacterial cultures are discussed.

The work is of great value and is to be recommended to students of veterinary medicine.

THE WASSERMANN REACTION. Its Technic and Practical Application in the Diagnosis of Syphilis. By John W. Marchildon, B.S., M.D., Assistant Professor of Bacteriology, St. Louis University, School of Medicine. Cloth. Price, $1.50. Pp. 103, with 11 illustrations. St. Louis: C. V. Mosby Company, 1912.

It is in the field of serology that the laboratory diagnostician finds exact technic most necessary. Practice must be frequent in order that this technic may be perfected and proper interpretations given to such tests as that of Wassermann. Marchildon believes that the Wassermann reaction should be more widely used in general practice and says that his purpose in this monograph is "to give the reader complete information that will enable him to get the material and to make the Wassermann reaction, providing he has a certain amount of laboratory training and skill."

That this laudable object has been attained is evident on perusal of the work. The subject-matter is divided into twelve chapters, each of which is clear and concise. The instructions for preparing the various reagents used are sufficiently adequate for general purposes. The original Wassermann test is advocated, the technic of the test being clearly outlined. The newer modifications are practically disregarded as unnecessary. The chapters dealing with the Wassermann reaction in diseases other than syphilis, and discussing the effect of antisyphilitic treatment on the Wassermann reaction, are especially interesting. Although it is doubtful if the general practitioner will ever be able to obtain satisfactory results with this test, we can commend this excellent little work to those who may wish to become more independent of the larger laboratories and to place themselves in a position better to understand and perform this most important diagnostic test.

SALVARSAN IN SYPHILIS AND ALLIED DISEASES. By J. E. R. McDonagh, F.R.C.S.; Surgeon to Out-Patients, London Lock Hospitals. Cloth. Price, $3 net. Pp. 152. Oxford Medical Publications. New York: Oxford University Press, 1912.

This supplementary volume to Power and Murphy's excellent "System of Syphilis" is by one of the earliest and most enthusiastic English advocates of salvarsan. It treats of salvarsan in the now familiar manner of its ardent propagandists, never underestimating its merits and explaining away with tenuous theories its failures and its accidents.

The author's ecstatic enthusiasm is indicated by the closing sentences of the book: "Ehrlich has done mankind a service which takes rank along with those of Lister and Jenner. To him the thanks will come . . . when his fellow men are worthy to understand him. . . ." The last sentence—that all will be well when we have become more worthy—has a curious resemblance to the Christian Scientist's attitude toward the unbeliever. To compare with Jenner's or Lister's unrestricted and inestimable gifts to mankind a patented remedy whose value is debated, but which sells for $175 an ounce, is to our mind almost profane.

RECENT METHODS IN THE DIAGNOSIS AND TREATMENT OF SYPHILIS (THE WASSERMANN SERUM REACTION AND EHRLICH'S SALVARSAN). By Carl H. Browning, M.D., Lecturer in Clinical Pathology, University of Glasgow, and Ivy McKenzie, M.A., B.Sc., M.B., Ch.B., Director, Western Asylums' Research Institute, Glasgow. In Collaboration with Others. Cloth. Price, $2.50 net. Pp. 303. Philadelphia: Lea & Febiger, 1912.

This is one of the flood of books on these subjects which have appeared since Ehrlich struck the rock. It is a book on the serum complement reaction and Ehrlich's treatment, written from the laboratory. The subject of serum complement fixation is fully and satisfactorily considered. The salvarsan part of the book takes up about eight pages and is less valuable; but that is not to be wondered at, for it must have been written more than a year ago, and that subject is changing so fast that any complete statement of it must be out of date before it can be put into print. The book is an excellent one of its kind—laboratory treatises on syphilis—but too many of the kind are being written. The knowledge of syphilis has not yet reached such a point that its complete mastery can be obtained by study of it *in vitro*.

POISON IVY AND SWAMP SUMACH. By Annie Oakes Huntington. Boards. Price, $0.75. Pp. 58, with illustrations. Jamaica Plain, Mass.: Published by the Author, 1908.

This is a well-written description of those wretched troublemakers, poison ivy and poison sumach. While the book is not large, it contains the essentials—all that it is necessary for one to know about the subject. The descriptions of the plants are clear and easily understood; these with the illustrations make it easy to recognize the plants at any season of the year. The suggestions for treatment are sensible. The book, though written for the layman, will be found of practical interest to the physician.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ARIZONA: Phoenix, October 7-8. Sec., Dr. John Wix Thomas.
GEORGIA: Regular, Atlanta, October 8-10. Sec., Dr. C. T. Nolan, Marietta.
KANSAS: National Hotel, Topeka, October 8. Sec., Dr. H. A. Dykes, Lebanon.
MICHIGAN: Capitol Bldg., Lansing, October 8-10. Sec., Dr. B. D. Harison, 504 Washington Arcade, Detroit.
MISSISSIPPI: Capitol, Jackson, October 22-23. Sec., Dr. W. W. Smithson.
NEW JERSEY: Capitol Bldg., Trenton, October 15-16. Sec., Dr. H. G. Norton.
NEW MEXICO: Santa Fe, October 14. Sec., Dr. W. E. Kaser, East Las Vegas.
OKLAHOMA: Muskogee, October 7-9. Sec., Dr. John W. Duke, Guthrie.
UTAH: Salt Lake City, October 7-8. Sec., Dr. G. F. Harding, 310 Templeton Building.
WYOMING: Riverton, October 9-11. Sec., Dr. A. B. Tonkin.

Reregistration of Physicians in Virginia

The new medical practice act secured recently in Virginia requires that on or before March 12, 1913, every physician practicing in the state must register in the office of the circuit or corporation court of the county or corporation in which he resides, presenting a certificate issued to him by the Medical Examining Board of Virginia, in order to be a legal practitioner.

This requirement was necessary in order that the licensing board might know what physicians had the legal right to practice. Under the former practice act physicians who had paid a license tax to any commissioner of revenue prior to Jan. 1, 1885, were not required to secure a certificate of license nor even to register. As a consequence there was no complete list of those who had the legal right to practice and it was also very difficult to convict impostors for practicing illegally.

A fee of only 50 cents is charged for the verification certificate and the practitioner must present satisfactory evidence that he was a reputable practitioner of medicine prior to 1885, or if an osteopath, prior to 1903. Those not securing verification certificates prior to March 13, 1913, will be subject to a penalty.

There are three states, Texas, Pennsylvania and now Virginia, which have secured practice acts requiring a reregistration of all physicians whereby the public may be protected from the uneducated, incompetents, quacks and impostors. There are other states which do not have complete lists of those licensed and which would do well to secure a similar requirement.

New Mexico July Report

Dr. W. E. Kaser, secretary of the New Mexico Board of Health and Medical Examiners, reports the written and oral examination held at Santa Fe, July 8-9, 1912. The number of subjects examined in was 12; total number of questions asked, 100; percentage required to pass, 75. Only one candidate was examined and he failed. Eighteen candidates were licensed on presentation of satisfactory credentials. The following colleges were represented:

LICENSED ON PRESENTATION OF SATISFACTORY CREDENTIALS

College	Year Grad.	Total No. Examined
Gross Medical College	(1899)	1
University of Colorado	(1911)	2
Coll. of Physicians and Surgeons, Los Angeles	(1906)	1
Northwestern University Medical School	(1901)	1
Louisville Medical College	(1893)	1
Tulane University of Louisiana	(1894) (1907)	2
Maryland Medical College	(1905)	1
Harvard Medical School	(1902)	1
University Medical College, Kansas City	(1893)	1
St. Louis University	(1904)	1
Missouri Medical College	(1898)	1
University and Bellevue Hospital Medical Coll.	(1900)	1
University of Pennsylvania	(1909)	1
Jefferson Medical College	(1899)	1
University of Tennessee	(1908)	1
Milwaukee Medical College	(1912)	1

FAILED	Year Grad.	Per Cent.
Keokuk Medical Coll., Coll. of Phys. and Surg.	(1907)	72.6

Maine July Report

Dr. Frank W. Searle, secretary of the Maine Board of Registration of Medicine, reports the written examination held at Augusta, July 16-17, 1912. The number of subjects examined in was 10; total number of questions asked, 90; percentage required to pass, 75. The total number of candidates examined was 52 of whom 44 passed and 8 failed. Two candidates were licensed through reciprocity. The following colleges were represented:

PASSED College	Year Grad.	Per Cent.
Yale Medical School	(1911)	88
Medical School of Maine	(1912)	81, 84, 84, 87, 87, 88, 90
Baltimore Medical College	(1903)	87
Maryland Medical College	(1911)	76
Harvard Medical School	(1900)	85; (1909) 90; (1912) 86
Tufts College Medical School	(1909)	81; (1911) 83, 85; (1912) 75, 78, 81, 82, 84, 87.
Boston University School of Medicine	(1912)	85, 89
College of Physicians and Surgeons, Boston	(1910)	79, 89; (1912) 77, 77, 78, 81, 83.
Columbia University College of Phys. and Surgs.	(1908)	89
University of Pennsylvania	(1911)	85; (1912) 86, 90
Jefferson Medical College	(1908)	78; (1910) 85; (1912) 85, 89
University of Vermont	(1912)	81, 84
McGill University, Montreal, Quebec	(1907)	94; (1912) 85
Laval University, Montreal, Quebec	(1912)	76

FAILED College	Year Grad.	
Kansas Medical College	(1895)	*47
University of Louisville	(1912)	72
Maryland Medical College	(1912)	†76, †77
College of Phys. and Surgs., Boston	(1911)	74; (1912) *69, 73
Laval University, Montreal	(1910)	71

LICENSED THROUGH RECIPROCITY College	Year Grad.	Reciprocity with
Hahnemann Med. Coll. and Hosp., Philadelphia	(1895)	Delaware
University of Vermont	(1912)	Vermont

* An official communication received from the school indicates that this candidate is not a graduate.

† Fell below the required average in one subject.

Porto Rico License Report

Dr. M. Quevedo Báez, secretary of the Porto Rico Board of Medical Examiners, reports that since January 1, 1912, 8 candidates have been licensed to practice medicine. The following colleges were represented:

College	Year of Grad.
Kentucky University	(1904)
Detroit College of Medicine	(1911)
Syracuse University	(1911)
Jefferson Medical College	(1911)
Woman's Medical College of Pennsylvania	(1911)
Medico-Chirurgical College, Philadelphia	(1912)
Central University of Venezuela	(1909)
University of Barcelona, Spain	(1896)

Medicolegal

Liability of Corporations for Medical Services Rendered to Injured Persons—Power of Subordinate Employees to Employ Physicians

(Rich vs. Edison Electric Co. (Cal.), 123 Pac. R. 230)

The District Court of Appeal of California, Second District, reverses a judgment rendered in favor of the plaintiff for $827, remanding the case for a new trial, on the ground that the verdict must be deemed excessive as, including services rendered without instructions. The court says that the evidence tended to show that an employee of a water company was injured by coming into contact with electric wires belonging to the defendant electric company. The employee of the defendant in charge of the wires called the plaintiff to the scene, and the injured man was then taken to the plaintiff's hospital, where a leg was amputated and other operations performed to save the man's life. About the time these operations were concluded, nothing remaining to be done, except to apply some dressing, the chief surgeon of the defendant arrived, made a cursory examination of the injured man's condition, recommended that certain things be done, and directed the hospital authorities to give the patient every possible care. A payment of $70 on account was subsequently

made by the assistant to the president and general manager of the defendant, which assistant told the hospital authorities, within a day or two after the accident, to take every care of the patient, and that the defendant would see to their compensation. The court distinguishes in liability on the part of the defendant between the services rendered before the representative of the general manager or chief surgeon of the defendant arrived on the scene, and those rendered afterward.

The court says that there was evidence in the record ample to support the verdict as to the hospital charges. It mattered not whether any legal or moral obligation rested on the defendant to care for this injured man; it was sufficient that his injury was occasioned through instrumentalities employed by the defendant, and that officers and agents of the defendant with ostensible authority directed the hospital authorities to continue the service. The evidence was undisputed that a medical department of the defendant, under the charge of the chief surgeon mentioned was maintained, by authority of the corporation, for the purpose of looking after persons who were injured on the system, and that the chief surgeon had been authorized to make arrangements for their care in outside towns, when injuries occurred. In addition to this, the assistant to the president of the company, who was also its general manager, had authority to look after the interests of the company where such special attention could not be given by the general manager at the time; and it must follow that, where he acted in the line of his employment, he was the representative of the general manager, and in an emergency of the kind here presented possessed the authority, in behalf of the company, to look after this injured man, even though technically no liability attached to the company on account of the injury. The rule, to the mind of this court, is well established that even subordinate employees of a corporation, who, under ordinary circumstances, are not empowered to bind the corporation by contract, nevertheless possess power, where an urgent necessity exists for immediate employment by reason of injuries incident to the operations of the corporation, to employ medical help to alleviate the condition of persons so injured. The plaintiff in this case had the right to assume that the representations stated of the heads of their respective departments possessed the authority which they assumed; and, it appearing that the general manager of the company had knowledge of the conditions, and took no action personally in the premises, his acquiescence and that of the corporation must be presumed.

A different question, however, was presented as to the surgical services performed before any instructions were given by the officers of the corporation. It may be true that, had the record disclosed the fact that the injury to the man was occasioned through the negligence of the defendant company, from which would arise a legal obligation imposed by law, and surgical services were rendered to save the life of the injured one, thereby lessening the damages which would thereafter result to the corporation in the event of death, the corporation would not be heard to say that such services, rendered for its benefit, were unauthorized, and thus avoid payment. But an examination of the record in this case failed to disclose that any legal liability existed on the part of the defendant corporation by reason of this injury. It was true that a stipulation was found in the record to the effect that the injured man brought suit against the company, and that subsequently the same was settled and dismissed through the payment of $4,500. But the mere settlement of an action for damages brought against a defendant does not of itself establish the matters involved in the question of legal liability. It may be, and often is, the case that actions of this character are settled and dismissed, where no liability exists; other considerations entering into the transaction. The court thinks that, if the negligence of the defendant occasioned the injury in this case, it should have been established, in order that it might be made to appear that the plaintiff performed a duty devolving by law on the defendant, and for which, in equity and good conscience, he should be compensated. For aught that appeared in this record, the surgical services were voluntarily performed, and that no legal duty rested on the defendant corporate to compensate the plaintiff therefor.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

Southern Medical Journal, Nashville

September, V, No. 8, pp. 511-582

1 *Cinematograph as Aid to Medical Education and Research. R. Matas, New Orleans.
2 Comparative Observations on Biologic Characters of Sp. Pallida and Sp. Pertenuis. H. J. Nichols, Washington, D. C.
3 *Treatment of Hemorrhagic Malarial Fever Without Use of Quinin. D. S. Brockway, Livingston, Ala.
4 *Malarial Hot-Bed Within Sight of National Capitol. T. W. Jackson, Fort Washington, Md.
5 *Malaria as It Concerns General Practitioner. E. D. Holland, Hot Springs, Ark.
6 Fever; Malaria; Quinin. A. Hand, Shubuta, Miss.
7 Tuberculosis Among United States Troops Serving in Tropics. I. W. Brewer, Ithaca, N. Y.
8 *Association of Kidney Infection with Chronic Infection of Appendix and Large Bowel. E. M. Williams, Patterson, La.
9 *Forbidden Food for Epileptic. H. Crenshaw, Atlanta, Ga.
10 Ulcero-Membranous or Vincent's Angina. E. S. Tenney, Mindanao, P. I.
11 Pistol-Ball Penetration of Left Ventricular Cavity Without Hemorrhage; Treatment of Heart Wounds. H. B. Gessner, New Orleans.
12 Suprapubic Versus Perineal Prostatectomy. J. M. Wilson, Mobile, Ala.
13 *Pellagra as It Exists in Alabama. M. B. Cameron, Eutaw, Ala.
14 Feeding in Typhoid. M. S. Davie, Dothan, Ala.

1. Abstracted in THE JOURNAL, Jan. 6, p. 59.

3. **Treatment of Hemorrhagic Malarial Fever.**—The treatment is summed up by Brockway in four words: Elimination, prompt, quick, heroic. The more recent studies of the bacteriologist show the perils lying in retention of toxins in the body. Failure of renal elimination spells death. The one thing needed above all else is free and speedy purgation, and there is no therapeutic agent in Brockway's experience equal to the sulphate of magnesium on account of its greater osmotic action and speedy results. When first called to treat a patient suffering from hemorrhagic malarial fever, he gives a large dose of calomel, 20 grains or more, to arouse the glandular secretions, and for fear a sufficient amount of the saline will not be retained to produce the desired effect. Cover the patient with blankets, place hot water bags or heat by other means around the body in order to produce free and prolonged diaphoresis.

Beginning an hour after giving the calomel Brockway gives a tablespoonful of sulphate of magnesia every two hours until the desired effect has been produced. If the salts cannot be retained he gives the following prescription, which he has found to agree with the most delicate stomach:

℞	gm. or c.c.		
Magnesii sulphatis	8		ʒ ii
Acidi tartarici	4		ʒ i
Tincturæ cardamomi compositæ	16	or	ʒ iv
Aquæ q. s. ad.....	120		ʒ iv

Sig.: Two tablespoonfuls every two hours till the desired effect is produced.

If there is a copious flow of urine from the beginning and throughout the attack, he says the patient will rapidly recover and the urine will clear up in from thirty-six to forty-eight hours; but if the urine is scanty from the beginning and continues so, although it may clear up and be perfectly normal in appearance, yet the patient is in great danger, and a fatal termination may be looked for.

Copious draughts of very hot water will have the effect of washing out the superabundance of bile that often finds its way into the stomach and enables the patient to vomit with less strain, and renders him more comfortable, at least for a while; this can be repeated as often as necessary. The nausea will often subside after there have been several movements from the bowels. If the nausea still persists the hypodermatic injection of ¼ gr. (0.015) of morphin sulphate will often have a magic effect in allaying the irritability of the stomach and will enable the patient to retain a sufficient amount of salts to have the desired effect.

4. Abstracted in THE JOURNAL, July 27, p. 1299.

5. **Malaria As It Concerns General Practitioner.**—Holland says that if doctors will only use their microscopes they will

be surprised at the number of complicated and obscure diagnoses which can be spelled *m-a-l-a-r-i-a*.

8. **Association of Kidney Infection.**—It is held by Williams that the pyelitis and bacilluria so frequently met with in infants and young children is not an ascending infection; that it is not due, as has been supposed, to uncleanliness in management of the patient during enterocolitis, but is rather the result of a hematogenous infection which is caused primarily by an inflammatory lesion of the bowel mucous membrane which permits the migration of bacteria into the blood. This tendency of bacteria to work their way into the intestinal structures when an atrium of inflammatory desquamation or ulceration is made for them is well known. A very considerable number of instances of infection of the kidney occur in subjects who are chronically constipated; who have attacks of appendix colic in which concretions are found within the appendix; who have a membranous pericolitis, chronic diverticulitis, or, in brief, any obstinate intestinal lesion which favors stasis of the fecal current, minute abrasions or ulcerative lesions of its mucous membrane and migration of bacteria into the blood-stream. The possibility of migration of bacteria directly through membranous and pseudomembranous formations surrounding the bowels, has been clearly demonstrated. Some cases of primary tuberculosis of the kidney may be due to the same cause. As a first cause may always be expected to act, even after the removal of its symptoms, it is wise to look closely into cases of relapsing infection of the kidney, with the possibility in mind of a large intestine lesion, which should be eradicated if found, thus lessening the chances of further difficulty.

9. **Forbidden Food for the Epileptic.**—Crenshaw insists that the epileptic taboo red meat, coffee, tea, etc., alcohol in any form, common salt and overindulgence in the great game of gastronomics.

13. Abstracted in THE JOURNAL, May 11, p. 1472.

California State Journal of Medicine, San Francisco

September, X, No. 9, pp. 357-398

15 Collection Bureau Plan of Los Angeles County Medical Association. G. H. Kress, Los Angeles.
16 Standardization of Reagents for Wassermann Test. W. V. Brem, Los Angeles.
17 Progress in Diagnosis and Treatment of Syphilis. E. D. Chipman, San Francisco.
18 Abortive Treatment of Syphilis. H. Morrow and L. S. Schmitt, San Francisco.
19 Fallibility of Salvarsan. L. J. Roth, Los Angeles.
20 Salvarsan in Various Medical Disorders Associated with Wassermann Reaction. W. F. Cheney, San Francisco.
21 Barany's Investigation of Localization in Cerebellum. K. Pischel, San Francisco.
22 General Anesthesia in Contract Work. V. H. Hulen, San Francisco.
23 Radiologic Investigation of Diseases of Stomach. C. M. Cooper and G. L. Painter, San Francisco.
24 Diagnosis of Latent Gonorrhea in Female. W. S. Johnson, San Francisco.
25 Clinical Features and Neurologic Findings in Poliomyelitis. T. J. Orbison, Los Angeles.
26 Necrosis of Hyoid Bone. A. B. Baer, San Francisco.
27 Salvarsan in Europe. C. D. Lockwood, Pasadena.
28 Salvarsan vs. Mercury. V. Vecki, San Francisco.

Philippine Journal of Science, Manila

April, VII, No. 2, pp. 67-128

29 *Infantile Beriberi. V. L. Andrews, Manila.
30 *Effect of Tropical Sunlight on Men, Monkeys and Rabbits and Proper Clothing for Tropical Climate. H. D. Gibbs, Manila.
31 Typhoid in Philippine Islands from Sanitary Standpoint. V. G. Heiser, Manila.
32 Some Common Siphonaptera of Philippine Islands. C. Fox, Manila.

29. **Infantile Beriberi.**—Andrews claims that the high infant mortality in Manila is due to infantile beriberi. This high death-rate of infants is due primarily to the quality of the mother's milk. The mother's milk lacks something which is essential for the growth and development of the nerves of the child. The disease is not due to an infection or toxemia of either the mother or the child. Another link has been added in the chain of evidence showing that beriberi is a nutritional disturbance. As a prophylactic measure, the dealers handling rice should be required to keep on hand the undermilled variety, and a campaign of education should be carried on for the purpose of enlightening the poorer classes, especially the pregnant women.

30. **Effect of Tropical Sunlight.**—In this paper the measurements of the skin temperatures in the tropical sun, of a number of different races, the temperatures under the hair and under various kinds of clothing, and the subcutaneous temperatures of monkeys and rabbits together with some observations of the physiologic effects of sunlight are described. Gibbs found that in the shade, the skin temperatures of human beings remain constantly below blood temperature. In the sun the temperatures of the lighter-colored skins sometimes rise more rapidly than those of the darker colors, but, after the initial rise, the darker colors maintain higher maxima than the lighter, provided the exposure of the lighter-colored skins is not too long. Usually temperatures of the darker-colored skins rise more rapidly. In the case of too long exposure an irritation of the sensory nerve-endings, nerve-endings in the vessel walls, or of the vessel walls themselves, produces a flushing of the skin due to a greater quantity of blood and a more rapid flow. This effect is absent in the darker skins, the pigmentation of which is undoubtedly a protection in this regard.

While the darker skins absorb heat more rapidly, the radiation is more rapid than from those of lighter colors, and, since, in full sun, the proportion of the body exposed is less than the proportion in the shade, the darker-skinned races may for this reason be somewhat better prepared to withstand the sun. In the sun, hair temperatures above 40 F. and a maximum of 50.1 F. are recorded. Gray-haired monkeys showed normal subcutaneous temperatures in the shade and were quite comfortable, while in the sun the temperatures rose above 48 F. and death ensued.

All measurements of temperature were made by means of thermocouples, and the subjects, men, monkeys and rabbits, were protected from air currents. Clothing for human beings for protection from the sunlight, should afford the greatest shade without obstructing air currents carrying off evaporated moisture. The superiority of white over colored materials as a reflector of the sun's rays is demonstrated by the experiments with rabbits and a few measurements under clothing. The ideal condition is attained by the shade of a white umbrella lined with green cloth and supplemented by as little clothing as possible. A broad-brimmed, light-weight, white helmet, the band of which is so arranged that the frame of the hat does not touch the head and allows the free passage of air currents, is the best substitute for an umbrella.

Texas State Journal of Medicine, Fort Worth

September, VIII, No. 5, pp. 133-156

33 Anoci-Association; New Principles in Operative Surgery. G. W. Crile, Cleveland.
34 Diagnosis of Malaria. W. Shropshire, Yoakum.
35 Enlargement of Prostate. C. Johnson, Fort Worth.
36 Is the Examination of Feces of Practical Value? M. A. Wood, Houston.
37 Value of Early Mixed Feeding in Infancy. G. M. Decherd, Austin.

Canadian Medical Association Journal, Toronto

September, II, No. 9, pp. 751-858

38 *Typhoid Pleurisy. F. G. Finley, Montreal.
39 Deep Injections of Alcohol for Trifacial Neuralgia; 102 Cases. D. A. Shirres, Montreal.
40 Action of Drugs on Uterus. N. C. Sharpe, Toronto.
41 *Two Cases of Typhoid Which Show Uncommon Lesions Due to Bacillus Typhosus. M. W. A. McNaughton and L. J. Rhea, Montreal.

38. **Typhoid Pleurisy.**—Finley's paper is based on a study of the literature of the subject and an analysis of nineteen cases which have occurred at the Montreal General Hospital in 2,200 cases of typhoid treated from 1897 to June, 1912. He concludes that pleurisy occurs in from 1 to 2 per cent. of cases of typhoid, although in some epidemics a much larger proportion may occur. Most cases of pleurisy in typhoid are due to the typhoid bacillus, and there is a preceding lesion of the lung in many cases. Typhoid pleurisy is usually a benign condition, and does not materially add to the danger of the disease.

41. **Two Cases of Typhoid.**—One of the patients reported on in this paper developed an acute purulent pericarditis, the other an acute hemorrhagic pleuritis. Both patients died.

Journal of Arkansas Medical Society, Little Rock

September, IX, No. 4, pp. 91-112

42 *Testing Efficiency of Collateral Circulation as Preliminary to Occlusion of Great Surgical Arteries. C. W. Allen, New Orleans.
43 Bacterins and Bacterin Therapy. A. L. Carmichael, Little Rock.
44 *Surgical Side of Pediatrics. E. E. Barlow, Dermott.

42 and 44. Abstracted in THE JOURNAL, June 29, p. 2048.

Journal of Medical Research, Boston

September, XXVII, No. 133, pp. 1-114

45 *Filterable Viruses, a Summary. S. B. Wolbach, Boston.
46 Chronic Ulcers (Ulcus Tropicum) from Gambia. S. B. Wolbach, Boston, and J. L. Todd, Montreal.
47 Congenital Atresia of Esophagus with Esophagotracheal Fistula. F. R. Zeit, Chicago.
48 Microscopic Demonstration of Fats in Tissue Sections. H. H. Bullard, New Orleans.
49 Differentiation of Cultures of Streptococcus. D. H. Bergey, Philadelphia.
50 Effect of Injection of Bovine Bile Into Rabbits. C. Frothingham and G. R. Minot, Boston.
51 Parasitology of Trypanosomiasis. S. B. Wolbach and C. A. L. Binger, Boston.
52 *Relative Importance of Bovine and Human Types of Tubercle Bacilli in Different Forms of Tuberculosis. W. H. Park and C. Krumwiede, New York.

45. Filterable Viruses.—An investigation of the properties and behavior of the filtered viruses by Wolbach shows that a somewhat significant grouping is possible. One group is transmitted by intermediate hosts: biting insects of some sort. The mosquito transmits African horse sickness, yellow fever and dengue fever. Sand-fly fever is transmitted by a midge, and typhus fever by a body louse. Experiments have proved almost beyond doubt that the swamp fever of horses and the catarrhal fever of sheep are transmitted by an intermediate host as yet undiscovered. All of these diseases are essentially blood infections: diseases in which the parasite is primarily a blood parasite. It is quite possible, in the light of recent experimentation and statistical studies, that poliomyelitis requires an intermediate host for its transmission. One group of diseases requires entrance of the virus directly into the tissue through an abrasion or injury to the surface of the body. These are rabies, molluscum contagiosum, verruca vulgaris, chicken sarcoma and probably trachoma, though it is possible that the last may secure a hold on a normal conjunctiva. One group is transmitted by contact, which of course means contamination with infected material, such as discharges from the eyes, respiratory tract, surface lesions and excreta.

One rather striking feature of the diseases with filterable viruses is the nature of the immunity. In nearly every instance, immunity is complete and of long duration, and in many instances artificial immunity has been secured through protective inoculations. In nearly every case successful passive immunity has not been obtained, which would indicate that, unlike most bacteria, these viruses produce but little in the way of toxins. Bacteria play an important secondary part in some diseases caused by filterable viruses; it is even probable that the typical disease picture is produced only by the combined effect of the filterable virus and bacteria, as in scarlet fever.

52. **Bovine and Human Types of Tubercle Bacilli.**—In the authors' series of non-selected fatal cases under five years of age bovine infection constituted 12½ per cent. They had nine patients from a foundling asylum, under 6 years of age, who were exclusively cow's milk fed. Of these, five were bovine infections. If the fatal cases in this series are deducted from the total cases, the bovine infections comprise about 10 per cent. In a non-selected series of fatal cases from the Babies' Hospital 6⅓ per cent. were due to bovine infection. On the whole, bovine infection causes somewhat less than 10 per cent. of the total deaths in young children.

Journal of Medical Society of New Jersey, Orange

September, IX, No. 4, pp. 167-220

53 *Common Diagnostic Errors. R. C. Cabot, Boston.
54 *Analysis of Refracting Optician Evil; Appeal to General Practitioner. L. Emerson, Orange.
55 Cyclic Vomiting in Childhood. F. R. Sandt, Paterson.
56 *Opportunities. W. A. Wescott, Berlin.
57 *Sphygmomanometer as Aid in Diagnosis, Prognosis and Treatment of Few Important Diseases. J. D. Lippincott, Newark.

53, 54, 56 and 57. Abstracted in THE JOURNAL, August 10, pp. 477 and 479.

Interstate Medical Journal, St. Louis

September, XIX, No. 9, pp. 739-816

58 Rationalization of Mental Medicine. W. A. White, Washington, D. C.
59 Wassermann Reaction in Diseases Other Than Syphilis. J. W. Marchildon, St. Louis.
60 *Case of Primary Carcinoma of Lung. R. T. Gilchrist, Wauwatosa, Wis.
61 Laboratory Methods of Diagnosis of Typhoid. L. M. DeWitt and F. L. Evans, St. Louis.
62 Radiophalangeal Reflex in Lesions of Pyramidal Tract. M. W. Hoge, St. Louis.
63 *Triple Bismuth Meal for Gastro-Intestinal Fluoroscopy. E. H. Skinner, Kansas City, Mo.

60. Primary Carcinoma of Lung.—About Nov. 1, 1910, Gilchrist's patient, aged 64, experienced pain and swelling in the upper left side of the chest accompanied by loss of weight, loss of appetite, inability to sleep, slight cough and expectoration of mucopurulent material. There had been no chills, sweats nor fever. The pain had not been vere severe, was not influenced by respiration, but was made much worse by moving about. The patient was emaciated, of medium stature, with dry skin and palpable arteries. The pupils were equal and reacted to light and accommodation. The cervical lymph-nodes were not enlarged, the thyroid was of normal size, and there was no tracheal tug. The chest was symmetrical, except for a bulging in the left infraclavicular region, the tumor mass extending from above the first rib down to the third and from the left sternal border to the midclavicular line. The mass was of firm consistence, slightly elastic, intimately connected with the ribs and slightly tender. The skin and pectoral muscles were freely movable over the swelling. There was no pulsation, no discoloration of the skin, and no change of temperature.

The percussion note over the tumor was resonant. The breath-sounds at the apices were slightly harsh and a few piping rāles were heard over the front of the chest. The area of cardiac dulness extends 10 cm. to the left of the midsternal line and 4.5 cm. to the right in the third interspace. There was a systolic blow at the apex, and the pulmonic second sound was slightly accentuated. Posteriorly, the physical findings in the chest were negative. The area of liver dulness extended from the sixth interspace to a point 5 cm. below the costal border in the mammary line. There was no splenic enlargement. No masses were palpable in the abdomen. There was an incomplete inguinal hernia on the right side and slight enlargement of the inguinal lymph-nodes. The testicles were normal. The examination of the prostate was negative. The deep reflexes were normal and active. Repeated examination of the urine showed a specific gravity of from 1.024 to 1.028, a trace of albumin, no casts, no albumose and no sugar. The chemical test for blood was positive once. There was a moderate cough together with expectoration of a frothy mucopurulent sputum. Repeated examination of the sputum revealed no tubercle bacilli and no blood. There was no reaction to the injection of tuberculin. The Noguchi test was found positive.

A fluoroscopic examination showed the tumor mass continuous with the left border of the sternum, obscuring the anterior ends of the second and third ribs, denser than the ribs or sternum, and apparently lying in the chest wall. During his stay in the hospital, the patient steadily grew weaker, emaciation increased, the tumor mass increased in size and became more nodular. A second hard nodular mass appeared at the sixth right costochondral articulation. Death from exhaustion occurred forty-one days after entering the hospital. An autopsy performed three days later showed a primary carcinoma of the left lung, metastases to ribs, kidneys, mesenteric glands, adrenals, heart muscle and omentum; fatty liver, arteriosclerotic kidney, fibrous myocarditis, incomplete inguinal hernia.

63. Triple Bismuth Meal.—Since 1908 Skinner has used no opaque material for the fluoroscopic inspection of the gastro-intestinal tract other than bismuth oxychlorid, which is a rather expensive purified product. He has had absolutely no

untoward effects from this salt. It does not constipate like the subnitrate of bismuth, nor does it turn the stool black. In fact, it seems to pass through the alimentary tract unchanged, being a practically insoluble salt. The patient eats the first bismuth meal at 10 a. m. on the day previous to the examination. The second meal is eaten at 4 a. m. of the next day, and then the patient reports at 10 a. m. at the Roentgen-ray laboratory the same day. The usual meals intervene. There will be a twenty-four-hour bismuth meal in the colon, and a six-hour bismuth meal in the stomach, small intestine and cecum. From this first inspection one judges the motility and peristalsis of the alimenary tract. If there is a residue in the stomach after the six-hour interval, Skinner immediately suspects pyloric obstruction, or interference with the exit of food. If there is much residue in the ileum, he looks into the possibility of an ileal kink. After the thorough inspection of the disposition of these two meals, a third bismuth meal is administered which gives the position, the outline and peristalsis of the esophagus and stomach. Each bismuth meal consists of 2 ounces of bismuth oxychlorid thoroughly mixed into 8 to 12 ounces of thin porridge. It is eaten with cream and sugar or fruit juices, and is easily tolerated even by timid stomachs. A smaller meal of 4 to 6 ounces will suffice if the patient refuses to eat or retain more Where the patient prefers to drink, or he is unable to swallow small masses, Skinner advises the thorough mixing of 2 ounces of bismuth oxychlorid in about 14 ounces of milk fermented with the Bulgarian ferment.

Denver Medical Times and Utah Medical Journal

September, XXXII, No. 3, pp. 103-156

64 Too Limited Range of Medical Education. J. K. Miller, Greeley, Colo.
65 Relation of Hospital to Public. E. Stuver, Fort Collins, Colo.
66 Ether vs. Nitrous Oxid and Oxygen Anesthesia. J. W. Seybold, Denver.
67 Case of Meningeal Hemorrhage in Newborn Infant, with Recovery. M. H. Krohn, Denver.
68 Some Newer Conceptions of Infection and Immunity. E. C. Hill, Denver.

Journal of Biological Chemistry, Baltimore

September, XII, No. 3, pp. 317-522

69 Animal Calorimetry; Small Respiration Calorimeter. H. B. Williams, New York.
70 *Idem: Metabolism of Dog Following Ingestion of Meat in Large Quantity. H. B. Williams, J. A. Riche and G. Lusk, New York.
71 Guaninehexoside Obtained on Hydrolysis of Thymus Nucleic Acid. P. A. Levene and W. A. Jacobs, New York
72 Cerebronic Acid. P. A. Levene and W. A. Jacobs, New York.
73 Cerebrosides of Brain Tissue. P. A. Levene and W. A. Jacobs, New York.
74 *Amino-Acid Nitrogen of Blood. D. D. Van Slyke and G. M. Meyer, New York.
75 Structure of Thymus Nucleic Acid. P. A. Levene and W. A. Jacobs, New York.
76 Guanylic Acid. P. A. Levene and W. A. Jacobs, New York.
77 Preparation of Glucosides. W. A. Jacobs, New York.
78 Removal of Phosphotungstic Acid from Aqueous Solutions. W. A. Jacobs, New York.
79 *Protein Metabolism in Experimental Diabetes. A. I. Ringer, Philadelphia.
80 Organic Phosphoric Acid Compound of Wheat Bran. R. J. Anderson, Geneva, N. Y.
81 Studies in Bacterial Metabolism. A. I. Kendall and C. J. Farmer, Boston.
82 Idem. A. I. Kendall and C. J. Farmer.
83 Rôle of Gliadin in Nutrition. T. B. Osborne and L. B. Mendel, New Haven, Conn.
84 Chemistry of Gluconeogenesis; Quantitative Conversion of Propionic Acid Into Glucose. A. I. Ringer, Philadelphia.
85 Methyl Guanidin in Urine of Parathyroidectomized Animals. W. F. Koch, Ann Arbor, Mich.

70. Metabolism After Meat Ingestion.—A dog weighing 13.5 kgs., the heat production of which was 22.3 calories during an hour previous to food ingestion, was given 1,200 grams of meat at noon. The heat production rose to 30 calories in the second hour and 42 in the third. It was maintained above 40 calories per hour through the tenth hour. In the fourteenth hour, it had fallen to 37 calories and then remained at 30 calories up to the eighteenth hour, falling rapidly to 25 calories in the twenty-first hour. Ingestion of 700 grams of meat by the same dog caused an increase in metabolism which was less than that caused by 1,200 grams, but in the two cases the increase was proportionate to the quantity ingested. The increased metabolism was proportional to the nitrogen elimination, except in the second and third hours. In the second hour the metabolism rose almost to its maximum although the urinary nitrogen reached only a third of its maximum. Since the non-protein respiratory quotient for this period was often above 90, it appears that carbohydrate and not additional protein was oxidized during this hour. On this is based the argument made by the authors that the incoming amino-acids, in proportion to their mass action, stimulate the protoplasm to higher oxidation.

74. Amino-Acid Nitrogen of Blood.—With the finding of amino-acid nitrogen in the normal blood the authors hold that the hypothesis that the amino-acids formed in digestion are synthesized into blood protein while passing the intestinal wall, becomes superfluous. The increase in amino-acid nitrogen of the blood, noted during digestion of protein, is, furthermore, positive evidence that amino-acids as such do normally pass the intestinal wall and enter directly into the blood-current. The fact that the amino-acid content decreases but little during passage of the blood from the mesenteric vein out to the femoral artery indicates that the amino-acids are not held back or destroyed by the liver before reaching the other tissues. On the contrary, it seems that the amino-acids absorbed from the intestine circulate through the entire organism and are offered directly to the body cells in general. The fact that the amount of amino-acids normally present in the circulation is small, is accounted for by the rapidity with which the tissues take up amino-acids from the blood as soon as they become unusually abundant therein. This is illustrated by the disappearance of intravenously injected alanin from the blood-stream. The experiments here reported are preliminary to a more complete investigation of the problem of protein assimilation and of the effect of different physiologic and pathologic conditions on the amino-acids of the blood.

79. Metabolism in Experimental Diabetes.—Experiments were performed by Ringer which showed that in phlorhizin glycosuria the protein metabolism rises in part because of the hypoglycemia that is present in that condition. The giving of small quantities of glucose to phlorhizinized animals results in a sparing of protein, although all of the glucose is eliminated in the urine and none of it is burnt. This lends support to Landergren's hypothesis, which assumes that in starvation, a certain fraction of protein is metabolized for the formation of glucose, and that this fraction can be spared by carbohydrates and not by fat. The protein metabolism above the starvation requirement in pancreatic diabetes does not rise as high as in phlorhizin diabetes. The giving of glucose to a dog with pancreatic diabetes does not spare any protein. It is suggested that the protein metabolism is lower in pancreatic than in phlorhizin diabetes because of the hyperglycemia which prevents the catabolism of the so-called "dextrose protein."

Pennsylvania Medical Journal, Athens

September, XV, No. 12, pp. 925-998

86 Liberal Feeding in Typhoid. B. Kohn, Philadelphia.
87 Recurrent Anuria Due to Calculus Which Acted as Ball-Valve in Ureter of a Single Functionating Kidney. S. E. Tracy, Philadelphia.
88 Eclampsia in a Primipara Aged Forty-Five. J. O. Arnold, Philadelphia.
89 Practical Experiences With Spinal Anesthesia. L. W. Kohn, Scranton.
90 Medical Inspection of School Children. S. G. Dixon, Bryn Mawr.
91 Results of Examination of School Children of Meadville and Its Importance. C. C. Laffer, Meadville.
92 Red Bank Physicians' Protective Association from Beneficent, Ethical, Economical and Protective Standpoint. C. W. Coulter, Oil City.
93 Life History of Some American Insects That Carry Disease. H. Skinner, Philadelphia.
94 Placenta Prævia from Standpoint of a Country Practitioner. C. M. Coon, Laquin.
95 Gangrene of Bowel; Ovarian Cyst; Perforation of Stomach and Duodenum. H. J. Donaldson, Williamsport.
96 Relation of Refractive Errors and Nasal Abnormalities to Headache. N. S. Weinberger, Sayre.

Surgery, Gynecology and Obstetrics, Chicago

September, XV, No. 3, pp. 245-364

97 *Results of Permanent Intubation of Thoracic Aorta. A. Carrel, New York.
98 *Central Dislocation of Femur. G. T. Vaughan, Washington, D. C.
99 Treatment of Ununited Fracture. E. Martin, Philadelphia.
100 Surgery of Arteries. A. Vander Veer, Albany, N. Y.
101 Case of Non-Traumatic Diaphragmatic Hernia. C. L. Scudder, Boston.

102 Complete Obstruction of Duodenum Resulting from Impaction of a Large Gall-Stone. J. E. Thompson, Galveston, Tex.
103 Lever Action in Production of Traumatic Dislocation. G. G. Davis, Philadelphia.
104 *Talma Operation for Cirrhosis of Liver. E. A. Vander Veer, Albany, N. Y.
105 Nitrous Oxid-Oxygen-Ether Anesthesia: Administration; a Perfected Apparatus. F. J. Cotton and W. M. Boothby, Boston.
106 *Effects of Ureteral Ligation; Experimental and Clinical. J. D. Barney, Boston.
107 *Experimental Hydronephrosis. G. D. Scott, Sullivan, Ind.
108 Bismuth Poisoning. L. Mayer and G. Baehr, New York.
109 Procidentia Uteri. W. M. Polk, New York.
110 Sliding Hernia. P. F. Morf, Chicago.
111 Surgical Treatment of Puerperal Sepsis. W. E. Darnall, Atlantic City, N. J.
112 *Method of Ileosigmoidostomy With Formation of a Sigmoid Valve. E. A. Hall, Vancouver, B. C.
113 Improvement to Drainage Tube and Inflated Rubber Bag Arrangement for Liver Hemostasis and an Acknowledgment of Priority. J. R. McDill, Milwaukee, Wis.
114 Results of Routine Treatment of Structural Lateral Curvature by Means of Plaster Jackets. J. W. Sever, Boston.
115 Silver Wire Cable an Ideal Buried Metallic Suture. H. Lilienthal, New York.

97. Permanent Intubation of Thoracic Aorta.—Straight tubes of glass, aluminum, or of gold-plated aluminum were employed by Carrel. Their diameter was generally 9 or 10 mm. while their length was 45 mm. As the dogs were of various sizes, the tubes distended, exactly fitted the aorta, or were of relatively smaller caliber. Before being used, the tubes were paraffined. As soon as the tube was introduced into the lumen of the vessel, two silk threads which had been previously put around the aorta, were tied. These ligatures should be tied tightly enough to prevent the tube from slipping, but not too tightly; there is danger of cutting the aortic wall, which has been found to be very friable. The clamps were removed and the circulation reestablished through the intubated segment. There was generally no hemorrhage from the opening in the aortic wall. Eleven experiments were performed. Seven animals were intubated with a glass tube, three with an aluminum tube and one with a gold-plated aluminum tube. Two of the animals intubated with a glass tube died of hemorrhage eight and eleven days respectively after the operation. The accidents were due to preventable causes, the cutting of the aortic wall by the ligatures, and the breaking of the tube. It was found that no clot had deposited on the wall of the tube. In the five other cases, obliteration of the aorta or of the tube occurred suddenly from five to ninety-seven days after the operation. The tube or the aorta were found to be occluded by a fresh thrombus, which, in every case, started from a laceration of the wall due to the poorly finished upper or lower edge of the tube.

It appeared that thrombosis did not take place as long as no laceration of the vascular wall occurred. The form and the size of the tube in a large measure seemed to be responsible for this complication. These experiments have shown a new fact: The arterial blood flowed through a glass tube 9 or 10 mm. in diameter during periods varying from five to ninety-seven days. No deposit of fibrin on the wall of the tube occurred. Sudden occlusion of the vessel or of the tube took place following a laceration of the aortic wall by the roughly finished edges of the tube. The permanent intubation of a large artery is a simple operation. It may become practical if the shape and the nature of the tubes be modified in such a manner as to prevent the laceration of the aortic wall. It is probable that the use of smooth-edged gold tubes, or of tubes lined with a vein, will be followed by better results.

98. Central Dislocation of Femur.—The symptoms of central dislocation of the femur, according to Vaughan, are very similar to those seen in impacted fracture of the neck of that bone: (1) Outward rotation of the femur; (2) sinking of the trochanter or its approach toward the median line; (3) shortening; (4) restricted motion; neither flexion, adduction, abduction or rotation is normal. The limitation in the arc of rotation of the neck of the femur is striking; (5) presence of the femoral head in the pelvis. The diagnosis can be made from impacted fracture of the neck and from all other injuries which it resembles except certain other fractures of the pelvis, by feeling through the rectum, or seeing, by means of the roentgenogram, the head of the bone projecting into the pelvis. From certain other fractures of the pelvis with projection of the head into the pelvic cavity, the diagnosis can be made only by means of the Roentgen-ray or by exposure by operation. Reduction should be attempted as advised by the usual methods, namely: by traction outward and downward in the axis of the neck of the femur. Failing in these, the dislocation should be reduced by open operation.

104. Talma Operation for Cirrhosis of Liver.—It is Vander Veer's opinion that the operation of omentopexy is a justifiable one and that the ideal technic is, under general anesthesia, a median incision below the umbilicus, suturing as much of the omentum to the anterior abdominal wall as possible; and, above all, drainage for at least a week. This latter feature, he believes to be especially essential in the after treatment.

106. Effects of Ureteral Ligation.—It was found by Barney that sudden and complete occlusion of one ureter may produce no symptoms whatever, and uninterrupted recovery may ensue in 21 per cent. of cases, but in the event of an injury to both ureters there is complete anuria in all, as is to be expected, whereas, in the unilateral injuries suppression of the urine occurred in only 1.6 per cent. Ureteral fistulas are developed in 24 per cent., their site depending on the nature of the operation. Where only one ureter is ligated, pain and tenderness in the kidney, usually subsiding spontaneously, is to be expected in 26 per cent. It has not been found in cases of bilateral injury. Infection of the kidney produced by the injury to the ureter, or aggravated by it, and necessitating subsequent nephrectomy, occurred in 15 per cent. Both ureters may be clamped for as long as seventy-two hours with complete recovery after removal of the obstruction, whereas one ureter may be completely blocked for ten days without destroying the integrity of the kidney.

Of fifteen patients in whom the subsequent condition of the kidney was investigated by Barney, hydronephrosis was observed in 80 per cent., but in no case was this of more than moderate size. In the remainder there was said to be "no change" in the condition of the kidney. The mortality of bilateral occlusion of the ureter is found to be 33.3 per cent., whereas, in unilateral occlusion the death-rate is 17.8 per cent., but in both instances we must consider the influence of other factors, such as the previous condition of the patient, and the severity of the operation. Barney's investigation of this series of cases shows (a) that there is strong probability that many a ureter is ligated without the fact being known, and (b) that in the presence of postoperative anuria, and in the absence of localizing symptoms examination of each ureter by the cystoscope may be the only means of determining whether one or both ureters have been occluded.

107. Experimental Hydronephrosis.—In Scott's experiments complete ligation of the ureter produced hydronephrosis, the degree depending on the duration of the obstruction. The changes occurring in the kidney parenchyma after complete obstruction of the ureter take place in a definite order. First, the straight tubules are dilated, then the convoluted tubules are similarly affected, and last to suffer are the glomeruli. These changes consist of dilatation of the tubules, flattening of the epithelium, granular changes of the epithelial cytoplasm and occasionally breaking of the cell wall. The interstitial tissue is usually increased and in late stages the blood-vessels are sclerotic. Compensatory circulation by anastomosis of the renal vessels with vessels entering the kidney through the capsule probably plays no part in determining whether a primary atrophy or hydronephrosis develops after complete ligation of the ureter. Incomplete obstruction of the ureter also produced hydronephrosis, the degree of hydronephrosis depending on the duration and on the pressure required to force urine past the constriction. Complete permanent obstruction produces hydronephrosis more rapidly than an incomplete obstruction of the ureter.

The microscopic changes following incomplete obstruction of the ureter are practically the same as those following complete obstruction. Complete ligation of the ureter retards

secretion of the kidney but will not completely arrest it. In hydronephrosis of highest degree, the kidney epithelium is never completely destroyed, but is capable of further secretion. Complete permanent ligation of the ureter does not produce atrophy of the kidney, but this resulted in one case of incomplete obstruction.

112. **Method of Ileosigmoidostomy.**—The upper sigmoid curve in many cases is found lying in contact with the terminal part of the ileum. These are the parts Hall unites. He describes his method as follows: 1. Locate these parts, pack them off with gauze, clamp the ileum 1½ inches from the valve. Pass a linen purse-string suture around the ileum beyond the clamp, cut and invert the distal end and separate the mesentery for about ⅓ of an inch of the proximal end. 2. Clear fat from the upper surface of sigmoid for a space of 2 inches, clamp above and below. Cut sigmoid transversely for about two-fifths of its circumference, beginning at the upper border of the well-defined anterior longitudinal muscle; with linen suture approximate the extremities of this incision, infolding the proximate flap within the bowel and suturing the surfaces for about 1½ inches, thus forming a sigmoid "valve." The distal flap following the contour of the bowel makes a lateral oval opening about the size of the ileum. If necessary this opening can be enlarged by a longitudinal slit. A small opening 2 inches lower in the sigmoid admits a clamp which is placed on the ileum as the former clamp is withdrawn, and the bowel drawn within the sigmoid. The points of apposition being secured by forceps, a catgut suture is sufficiently deeply placed to control hemorrhage, a musculoperitoneal suture of linen follows, continued along the ileosigmoid surface for an inch or two to limit tension on the anastomosed parts. The withdrawal of clamps and closure of the small incision complete the operation.

Journal of Michigan State Medical Society, Battle Creek

September, XI, No. 9, pp. 545-608

116 Plastic Surgery of Bones. J. B. Roberts, Philadelphia.
117 What is "Epilepsy?" C. D. Camp, Ann Arbor.
118 Formation of Section of Ophthalmology and Oto-Laryngology by Michigan State Medical Society. R. W. Gillman, Detroit.
119 Maxillary Sinusitis. B. N. Colver, Battle Creek.
120 Traumatic Myxosarcoma of Knee, Simulating Tuberculosis of Joint, With Report of a Case. F. C. Witter, Petoskey.
121 Clinical and Instrumental Methods of Estimating Efficiency of Heart. H. A. Freund, Detroit.
122 Two Hundred and Twelve Cases of Cancer of Uterus With Special Reference to Early Diagnosis. G. Kamperman, Ann Arbor.

Medical Record, New York

September 21, LXXXII, No. 12, pp. 507-552

123 *Etiology and Pathogenesis of Bronchial Asthma. A. G. Apostolides, Smyrna, Asia Minor.
124 Negro and His Health Problems. J. M. Taylor, Philadelphia.
125 Derailed Forces. M. A. Cleaves, New York.
126 Worry as Cause of Arteriosclerosis. H. C. Clapp, Boston.
127 Aneurysm (?) of Hepatic Artery. G. A. Friedman, New York.
128 Amenorrhea Due to Thyroid Insufficiency. P. K. Olitsky, New York.
129 Are Present Methods of Disposal of Human Excrement Satisfactory? I. W. Brewer, Ithaca, N. Y.

123. **Bronchial Asthma.**—Apostolides believes that idiopathic bronchial asthma is due to a congenital excitability of the cortical respiratory centers, which excitability itself is due to a toxemia depending on alterations of the internal secretion of certain glands. This mechanism is not an impossible one, but indisputable evidence of its actual existence has so far been adduced. Apostolides has known two patients about 4 years of age who have had a number of what are considered attacks of spasmodic laryngitis, a disease which was supposed at one time to be due to disturbances of the thymus and therefore received the name of thymic asthma. The patients are now about 12 years of age and are suffering from attacks of genuine bronchial asthma.

Boston Medical and Surgical Journal

September 19, CLXVII, No. 12, pp. 383-418

130 Indications for Major Obstetric Operations. F. S. Newell, Boston.
131 Salvarsan-Calomel Treatment of Syphilis. W. F. Boos, Brookline, Mass.
132 Bacteriologic Diagnosis, Intubation, and Antitoxin Treatment of Diphtheria. E. H. Place, Boston.
133 Significance of Symptoms in Pulmonary Tuberculosis. H. D. Chadwick and H. S. Wagner, Westfield, Mass.

New York Medical Journal

September 21, XCVI, No. 12, pp. 569-616

134 Sanitary Control of Prostitution in Some European Cities. F. Bierhoff, New York.
135 Skin Diseases in Relation to Nervous System. S. Pollitzer, New York.
136 Newer Teachings of Diseases of Alimentary Canal. M. I. Knapp, New York.
137 Syphilis and Gonorrhea As Depicted in the "Songes Drolatiques de Pantagruel." C. G. Cumston, Boston.
138 Some Diagnostic Aids in Gastric Diseases. E. A. Aronson, New York.
139 Clinical Observations of Trachoma. H. M. Friedman, New York.
140 Ten Sex Talks to Girls. I. D. Steinhardt, New York.
141 Mitral Stenosis and Pulmonary Tuberculosis. W. Narins, New York.
142 *Cardiac Disease and Pulmonary Tuberculosis. N. G. Seymour, New York.
143 Child and Constipation. N. J. Weill, Pittsburgh.

142. **Heart Disease and Lung Tuberculosis.**—Among the total number of charts from the Gouverneur Hospital Tuberculosis Clinic studied by Seymour, 2,151, there were 126 cases of cardiac disease noted. Sixty-two of these occurred among the positive tuberculous patients; sixty-one among the non-tuberculous, and only three from among those whose pulmonary condition was never diagnosticated. These groups were studied separately, since it is apparent that a very different significance attaches to the cardiac cases mistaken for pulmonary tuberculosis and those which were coincident with it.

Among the 519 non-tuberculous cases in series, there were sixty-one with cardiac diseases; that is, in 11.7 per cent. of the negative cases, mistaken for pulmonary tuberculosis, the misleading signs or symptoms were due to cardiac disease. These cardiac conditions were as follows: Chronic endocarditis, forty-six; mitral regurgitation, twenty-seven; mitral stenosis, eight; double mitral, nine; aortic regurgitation, one; double aortic, one; there was one case of myocarditis, one of secondary cardiac dilatation, nine of murmurs diagnosticated as functional, and four in which the murmurs were not identified.

Of 1,232 cases of pulmonary tuberculosis studied, sixty-two (5 per cent.) were complicated by cardiac disease. There were thirty-three cases of chronic endocarditis, as follows: Mitral regurgitation, twenty-five; mitral stenosis, seven; aortic stenosis, one. There was one case of pericarditis; eleven cases in which heart murmurs were detected, but their origin undecided; and seventeen in which the murmurs were diagnosticated as functional. The three cardiac cases occurring among the undiagnosticated pulmonary cases, were one mitral regurgitation, one functional murmur, and one murmur of uncertain significance. The cardiac cases occurred chiefly with complicating pulmonary conditions, or without complications of any kind. In summing up the general study of these cases, Seymour says two facts seem significant: First, that one of the most frequent errors encountered in diagnosis is that of pulmonary tuberculosis in cases of uncomplicated chronic endocarditis; and, second, that the combination of these two conditions is not very unusual, and therefore the recognition of an undoubted heart lesion does not preclude the possibility of a coexistent tuberculosis of the lung.

Lancet-Clinic, Cincinnati

September 7, CVIII, No. 10, pp. 249-266

144 Latent Tuberculosis of Infants. B. F. Lyle, Cincinnati.
145 New Procedure for Repair of Upper Portion of Vagina in Cases of Prolapse of Uterus. (Superior Colporrhaphy.) C. A. L. Reed, Cincinnati.
146 Suture Material. C. T. Souther, Cincinnati.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Clinical lectures, single case reports and trials of new drugs and artificial foods are omitted unless of exceptional general interest.

Australasian Medical Gazette, Sydney

July 27, XXXII, No. 4, pp. 81-107

1 Surgical Work in Country Practice. H. South.
2 Subcutaneous Section of Cricoid for Laryngeal Stenosis Following Intubation. G. Croll and A. J. Turner.
3 Action of Chloroform on Blood. J. W. Bean.
4 Scheme for Cultural Diagnosis of Typhoid Practicable in a Public Hospital Laboratory. A. E. Finckh.
5 Case of Ruptured Liver Treated Successfully by Operation. E. H. Binney.

August 3, XXXII, No. 5, pp. 109-136

6 Two Years' Salvarsan Therapy. A. E. Finckh.
7 *Five Hundred Patients Treated with Salvarsan. R. J. Millard.
8 *Three Hundred and Fifty Cases of Syphilis Treated with Salvarsan. E. H. Molesworth.

August 10, XXXII, No. 6, pp. 137-160

9 Fractures and Their Treatment. H. L. Maitland.
10 Two Cases of a Chronic Wasting Disease in Two Brothers, Diagnosed as (Probably) Cases of a Form of Myopathy Akin to Pseudo-Hypertrophic Muscular Atrophy. H. M. Lightoller.
11 Two Cases of Air Embolism. J. E. Dods.
12 Three Cases of Acute Ataxia in Children. W. F. Litchfield.

August 17, XXXII, No. 7, pp. 161-186

13 Effective Range of Infection. J. H. L. Cumpston.
14 Case of Acute Pancreatitis. W. E. Harris.
15 Case of Lobar Pneumonia with Relapse. D. D. Jamieson.

August 24, XXXII, No. 8, pp. 187-214

16 Direct and Indirect Cystoscopy. G. Craig.
17 Deaths from Strychnin Poisoning After Snake-Bite. G. Croll.
18 Some Cases of Ruptured Abdominal Aneurysm. A. Aspinall.
19 Case of Fractured Skull, with Ruptured Middle Meningeal Artery; Operations; Recovery. O. Smithson.
20 Color Sense in Relation to Emotion of Sex. G. H. Taylor.

7. **Salvarsan Therapy of Syphilis.**—The patients treated by Millard comprised: Syphilis: primary, 54; secondary, 286; tertiary, 129; congenital, three; total, 472. Cerebral syphilis, one; general paralysis of the insane, one; locomotor ataxy, three; lateral sclerosis, one; spinal myelitis, two; paraplegia, one; neurasthenia, two; chorea, three; hystero-epilepsy + chorea, one; leprosy, one; typhoid fever, two; general tuberculosis, one; lupus, one; anemia, two; gonococcal arthritis, three; cancer of tonsil, one; psoriasis, one; sycosis menti, one; total, 500.

In all 966 injections have been given, as follows: First injections: (*a*) Subcutaneous, thirty-five; (*b*) intramuscular, six; (*c*) intravenous, 459—500; second injections, intravenous, 379; third, sixty; fourth, eighteen; fifth, six; sixth, seventh, eighth (in one case), three; total, 966. The intravenous method of administration has been adopted after a brief trial of the subcutaneous and intramuscular methods. For the most part in this series of cases Millard has followed the routine of giving two full doses; *i. e.*, each .6 gm., with an interval of fourteen days. Of the 500 patients, 319 received a second injection and no more. But sixty patients received a third, eighteen a fourth, six a fifth injection, and one patient as many as eight injections in all. Generally speaking any injections after the second have been given on account of persistence of some symptoms of active syphilis in some cases and the persistence of positive Wassermann reaction. Most of the patients were vigorous adult males. For females, children and debilitated subjects, and for cases in which brain and spinal cord was diseased, Millard reduced the dose to .3 gm. or less. Four hundred and nine patients had the Wassermann reaction tested, but in the great majority it was not possible to keep in touch with these cases long enough to make successive observations of the effect on Wassermann reaction of the salvarsan treatment. Generally speaking, when such successive observations have been made the Wassermann reaction has been found to change from positive to negative, but the value of this as evidence of salvarsan efficacy has been discounted by the fact that the patients were generally taking mercury, which may have produced the negative effect. Many instances were observed of the so-called provocative effect of salvarsan, *i. e.*, a negative Wassermann reaction becoming positive after injection of salvarsan, or, if already positive, becoming more marked. This was noted in twelve cases, of which eight were tertiary syphilis, one locomotor ataxy and three secondary syphilis. One case showing obstinate persistence of positive Wassermann reaction is worth quoting in some detail.

The immediate effect on the lesions in active syphilis has been marvelous. If salvarsan could do no more than this it would be a most valuable addition to our therapeutic armamentarium since by speedily healing the chancres, condylomata, mucous ulcers, etc., it thereby seals up the main sources of infection, and must have a potent influence in restricting the spread of the disease. In the parasyphilitic diseases, such as locomotor ataxy, lateral sclerosis, etc., his results have not been encouraging. Generally the patient feels better after the dose, but the organic symptoms remain unimproved."

8. **Salvarsan in Syphilis.**—Comparing the immediate effects of salvarsan with those of mercury and potassium iodid, *i. e.*, with regard to their power of clearing lesions Molesworth says: (*a*) In the primary and secondary cases mentioned in the list not one failed to clear within a month—nearly all in a week to ten days. A little pigmentation was not infrequently left, but this cleared gradually without further treatment. In no primary case did a secondary rash develop. (*b*) Tertiary cases, including huge ulcerations with splinters of dead bone at the base, and measuring in one case over 2 inches across, cleared, granulated, and healed as fast as epithelium could grow over. (*c*) Congenital cases are more obstinate, especially interstitial keratitis, but even this certainly improves, although naturally the cellular infiltration and vascularization of the cornea is slow in clearing in such a spot. Tabes, except in the late stage, seems to greatly benefit.

In the direction of clearing up lesions, this list of 350 cases shows not one lesion which resisted more than three injections, and among them were numerous patients treated for a long time, thoroughly but unsuccessfully, with mercury, some of the lesions occurring during the treatment and persisting in spite of its continuance. In the 350 cases reported there have been about twenty recurrences, all treated early with small doses, intravenous or intramuscular, and two only with three injections given intravenously, and in each of these cases the dose given was .4 gm. or under. Among Molesworth's private patients, none of whom has received fewer than three injections, some four or five, and of whom only one-half have received any mercury, none has recurred. Again, since following the practice in hospital of giving the injections until the Wassermann became completely negative (a practice followed now for nine months), no such case has recurred, although only a very small number have received mercury afterward.

Lancet, London

September 7, II, No. 4645, pp. 675-742

21 Nature, Origin and Maintenance of Life. E. A. Schafer.
22 *Value of Quantitative Albumin Estimation of Cerebrospinal Fluid. J. G. Greenfield.
23 *Quantitative Cutaneous Tuberculin Test. E. C. Morland.
24 *Treatment of Flat Foot. P. B. Roth.
25 Coarctation of Aorta in Adult, with Death Due to Rupture of an Aneurysm in Neck. F. P. Weber and F. W. Price.
26 Case of Large Caseous Tubercle of Myocardium. W. J. McKeand and D. M. Reid.
27 Case of Very Exuberant Growth of Molluscum Contagiosum. W. Calwell.

22. **Albumin Estimation of Cerebrospinal Fluid.**—The method used by Greenfield in thirty-eight cases of nervous diseases of various kinds is a modification of Noguchi's butyric acid reaction; 2 c.c. of fluid are used, and the result of the test is poured into a graduated centrifuge tube, which gives readings to 0.1 c.c. with fair accuracy; each 0.1 c.c. by this method is equivalent to 0.025 per cent. Small quantities of fluid can thus be examined, and fairly reliable readings obtained from them. Greenfield found that a 0.4 c.c. precipitate corresponds fairly closely to 1 part per 1,000. Normal fluids gave readings of 0.05 to 0.2 c.c. (corresponding to 0.1 to 0.5 part per 1,000). Syphilitic meningitis and parasyphilitic disease gave readings up to 0.6 c.c., or 1.5 per 1,000, but in no uncomplicated case did Greenfield get readings above this level. In many cases of syphilitic nervous disease, even where some lymphocytosis was present, no increase of the albumin content was found, and this, he thinks, was probably owing to the disease being mainly vascular, or to the meningeal inflammation having subsided. Contrary to the statements of some text-books, he found the albumin content raised in tabes dorsalis to as high a degree as in any case of general paralysis examined. In other cases it was not above the normal level, and most often this was so in the chronic cases.

23. **Quantitative Cutaneous Tuberculin Test.**—Morland calls this test the quanti-Pirquet (q.-P. for short). Von Pirquet pointed out the possible quantitative application of his test, but it is comparatively recently that two Danish observers, Ellermann and Erlandsen, have worked out an ingenious method in which the sensitiveness can be determined by a series of simple measurements and the result expressed numer-

ically, thus affording an entirely objective standard of comparison from case to case. Morland has endeavored to simplify the procedure to the utmost and to soften the ruggedness of the calculations. [See THE JOURNAL, 1911, lvi, 856.]

The apparatus required consists of a spirit-lamp, a scarifier, some alcohol, and four different dilutions of old tuberculin (T), viz., 64, 16, 4 and 1 per cent. The most convenient scarifier is the platinum spade used by von Pirquet. The skin of the forearm over the brachioradialis muscle is rubbed with alcohol; the scarifier is held vertically between the thumb and forefinger, and with it four circular holes are drilled in the skin about an inch apart by a rapid twisting movement of the instrument on its long axis. The base of the pits should show vivid pink, but not actually bleed. The dilutions of tuberculin are made with the usual diluent of 0.5 per cent. phenol in normal saline. A drop is now applied to each scarification in turn, the weakest dilution distally (nearest the hand), so that a stronger solution shall not be carried by the lymphatics to a proximal spot. The excess of fluid is sopped up with tiny pieces of sterile wool and the moist spots left to dry for five minutes or so. The sleeve is then gently replaced and the patient instructed not to wash the forearm until the next day, to avoid rubbing or irritating it, and to present himself for observation after twenty-four to forty-eight hours.

The diameter of the resulting papules is measured in millimeters after twenty-four and forty-eight hours and the measurements charted. Only the papule is measured, not the surrounding zone (if present) of hyperemia, and the diameter of the scarification is subtracted as irrelevant. The sensitiveness value is really the inverse of the lowest strength of tuberculin which just gives rise to a reaction. Thus, if 5 per cent. be this strength, 100/5 or 20 is the sensitiveness value; or if 1 per cent. T just gives a reaction, q.-P. 100. The method assumes the possibility of measuring the papules accurately. The calculation further assumes that as the percentage of tuberculin used increases geometrically, the size of the papule only increases arithmetically. For instance, with dilutions 64, 16, 4 and 1 per cent., the papules may be 4, 3, 2, and 1 mm. It is very striking, Moreland says, how when the reaction is positive the papules, regarded as flat disks, fit evenly between two (imaginary) converging lines, and how a negative test is at once apparent by the disks (in this case of traumatic hyperemia only) being all of equal size. Ellermann and Erlandsen suggest that the value 100 is the crucial one clinically; below this point are the inactive, above it the active cases. In Morland's experience values above 100 were all suggestive of active disease; values below 50 of latent or arrested disease.

The application of the determination of q.-P. in practice is: (1) first and foremost, in the deciding of the question whether an existent tuberculosis is in such a condition as to require treatment, what may be called the clinical diagnosis of tuberculosis; (2) as a guide to the progress of a case, if favorable, q.-P. soon falls below the crucial limit; (3) in concluding or excluding the presence of tuberculosis in disease or ill-health where the diagnosis is doubtful; e. g. in bronchial asthma, bronchiectasis, enlarged glands, etc.; (4) in determining the initial dose of tuberculin for a therapeutic course (where q.-P. is high and the sensitiveness accordingly great, a small dose should be chosen to begin with); and (5) in standardizing any particular preparation of tuberculin and comparing two or more preparations.

In drawing a conclusion from the value of q.-P., certain points, Morland says, should be borne in mind: (1) the Pirquet reaction tends to disappear in advanced cases of tuberculosis and in miliary tuberculosis of rapid course; (2) it is constantly absent during the first ten days of measles and in some other transient acute conditions; (3) q.-P. tends to remain high long into convalescence from bone and glandular tuberculosis; and (4) in the negative phase of a tuberculin inoculation q.-P. may be very high, but it is remarkable how rapidly the large papules disappear as the positive phase sets in. The determination of q.-P. gives the degree of tubercular sensitiveness at the moment of examination and is a datum of great importance for diagnosis and as a guide to treatment.

24. **Treatment of Flat Foot.**—A treatment suitable, without slight modification, for all cases of static foot trouble (flat foot), from the early cases which are often described as "weak ankles" to the most severe cases where there is old-standing structural change is what Roth claims for his method. The treatment consists of: (1) attention to footwear; (2) attention to position in standing and walking; and (3) regular daily exercises. Whether boots or shoes are worn, whether they button or lace, they must be the shape of the feet. The inner side of the boot, where the big toe lies, is kept straight, so that the end of the boot is opposite the big toe, and not opposite the second or third toe. This is to ensure that the big toe is not pushed out against the other toes and has plenty of room in which to act. The soles should be a sixth to a fourth of an inch thick, the heels, broad, an inch or less in height.

If the degree of flat foot be anything more than the merest trace, mechanical means are utilized to throw the weight of the body, distributed down the leg, slightly outside the center of the ankle-joint. This is effected by thickening the sole and heel of each boot along its inner side by ¼, ⅜, or ½ inch, the amount depending on the severity of the case; the worse the case the greater the thickening. The additional leather is in the form of a wedge, with its base to the inside and its apex to the outside of the foot, so that the extra thickness on the inside fades off to nothing on the outside. Not only does it fade away outward toward the outside, but situated about an inch behind the tip.

The patient must always stand on both feet with the toes slightly turned in and the heels slightly turned out. He must never stand with the toes turned out, or on one foot to rest the other. Every now and then he must raise the heels just clear of the ground, that is, stand on the toes sufficiently to bring all the muscles of the foot into action. Whenever the feet begin to ache he should do this. In addition, he should stand with the feet very slightly turned over on their outer border. He must walk with the feet pointing straight forward, never with the feet turned out. If the feet are hurting, he must walk all the time very slightly on tip-toe, that, is, with the heels just off the ground. It is a good plan while indoors to walk on tip-toe all the time.

The exercises, to be done the first thing every morning, preferably with the shoes off, are two in number: 1. Standing, alternately heels raising and toes raising. The exercise is repeated from fifty to one hundred times. 2. Sitting on one chair, with the foot projecting over the edge of another, the calf of the leg resting on the seat. Keeping the knee still, the foot is slowly circumducted to its full extent in all directions, down, in, up, out, fifty times; then down, out, up, in fifty times. This treatment is said to remove the pain and discomfort of flat foot. As regards deformity it cures the slight cases, improves the moderate, and prevents the severe ones from getting worse. Even stiff and apparently hopelessly deformed feet get much more supple after a few months of this *régime*.

British Medical Journal, London

September 7, II, No. 2697, pp. 533-588

28 Educational Number, Sessions 1912-1913.

Sei-i-kwai Medical Journal, Tokyo

August 10, XXXI, No. 8, pp. 193-215

29 Analgesic Action of Masulsin. H. Sewaki.
30 •Value of Vaccine Treatment. Y. Takaki.

30. **Value of Vaccine Treatment.**—One hundred cases (*Staphylococcus aureus*, 55; *Streptococcus pyogenes*, 26; *Bacillus coli*, 4; Gonococcus, 14; Pneumococcus, 1) were treated with vaccines by Takaki. The results of these cases were generally favorable. In most cases there was gradual improvement and in certain cases a speedy improvement. In all cases there was no severe reactionary fever. Takaki thinks that the reactionary fever is caused by the injection of too large quantity of the vaccine. So the best way is to inject a small quantity several times instead of a large quantity. For injection both the subcutaneous and intramuscular methods may be adopted, but the latter is less painful and causes neither swelling nor reuness afterwards. Any part of the body can be selected as

the quantity injected is usually small. The effect of the vaccine varies in different kinds, but staphylococcus aureus seems to be more effective than the others. The mixed vaccine is not so successful. The auto-vaccine is more effective than the vaccine prepared from other cases, but at times just as effective. Takaki regards the vaccine treatment as a very useful adjunct to ordinary surgical methods. Vaccine treatment alone will not cure all the cases, but it will assist the other methods in bringing the speedy and complete recovery.

Journal of Laryngology, Rhinology and Otology, London

September, XXVII, No. 9, pp. 465-520

31 Serous Meningitis, Choked Disc and Multiple Polyneuritis of Certain Cranial Nerves in a Young Alcoholic Smoker. J. N. Roy.
32 Mechanism of Paracusis (Willisii). F. P. Sturn.

Journal of Tropical Medicine and Hygiene, London

September 2, XV, No. 17, pp. 257-272

33 Examination of Stools for Cysts of Entameba Tetragena. S. T. Darling.
34 Treatment of Leprosy by Nastin. K. S. Wise and E. P. Minett.

Annales de Médecine et Chirurgie Infantiles, Paris

June 15, XVI, No. 12, pp. 353-384

35 Acute Meningeal Syndromes in Course of Infectious Diseases. H. Grenet.
36 Chorea with Symptoms of Organic Nerve Disease. (Chorée de Sydenham avec symptomes nerveux organiques.) H. Grenet and P. Loubet.
37 Chorea and Infections. (Chorée et infection.) J. Roux.
38 Improved Technic for Subcutaneous injection of Oxygen. (Technique de l'hypodermie gazeuse et présentation d'un appareil oxygénateur automatique.) R. Bayeux.

July 1, No. 13, pp. 385-416

39 *Complications of Typhoid Fever in Children. (Quelques complications de la fièvre typhoide chez l'enfant.) Leenhardt, Maillet and Carrieu.
40 Adipose Sclerema in Patches. (Sclerème adipeux en plaques.) H. Triboulet, R. Dumas and Debré.

July 15, No. 14, pp. 417-448

41 Spasmophilia in Children. (Spasmophilie dans l'enfance.—Clinique et thérapeutique.) F. Peruzzi.
42 Dangers of Camphor or Menthol in Local Application in Infant's Nose. (Une pommade camphrée forte, introduite dans les narines d'un jeune enfant, peut avoir les mêmes inconvenients que le menthol.) M. Perrin.

39. Complications of Typhoid in Children.—Two boys, brothers, both with typhoid, developed phlebitis in the right or left leg. In another case a girl of 8 had a severe relapse when apparently convalescing from a mild typhoid. Another little girl of 10 had two severe intestinal hemorrhages the tenth and thirteenth day of typhoid. Each time the temperature dropped several degrees. All the children recovered.

Archives des Maladies du Cœur, etc., Paris

August, V, No. 8, pp. 497-560

43 Acute Leukemia in Healthy Young Drug Clerk with Death the Twelfth Day. L. Læderich, R. Debré and Gastinel.
44 Peripheral Venous Pulsation in Case of Aneurysm of the Ascending Aorta. G. Buicliu and D. Danielopolu.
45 Triple Rhythm of Mitral Stenosis. (Le rythme à trois temps du rétrécissement mitral est dû tantot à un dédoublement, tantot à un doublement apexien du deuxième bruit.) C. Lian.

Archives de Médecine des Enfants, Paris

July, XV, No. 7, pp. 481-560

46 *Local and General Reactions in Children to Tuberculin. (Les réactions locales et générales à la tuberculine chez l'enfant.) M. Péhu.

August, No. 8, pp. 561-640

47 Advantages of Seaside Hospitals and Sanatoriums for Surgical Tuberculosis (De l'importance des hôpitaux marins.) J. Calvé.
48 Decompressive Trephining for Brain Tumors; Two Cases in Children. (Trépanation palliative pour tumeurs cérébrales.) A. Broca.

46. Tuberculin Reactions in Children.—Péhu reviews the history of tuberculin reactions and the disputed question whether they are actually specific for tuberculosis. Conflicting reports have been published as to positive reactions in other diseases and in the absolutely healthy. Péhu sifts the evidence and concludes that in the present state of our knowledge, the specific nature of the reactions cannot be denied; although their qualitative specificity is not absolutely certain, yet their quantitative specificity—with tuberculin, at least—is beyond question. For estimation of the findings a standardized test tuberculin should be used, and a standard adopted to measure the reaction. As the local and the general reaction to tuberculin occur in many clinically healthy children, it is difficult to draw the line between the sound and the pathologic. The test should be harmless, convenient, and not extremely sensitive; none of the tuberculin tests proposed to date fulfils all these conditions. At the same time, the agreement between the findings with the various tests shows that patent or latent tuberculosis is of more frequent occurrence the older the children. The findings consequently are most reliable in children under 4 years old. Above this age, they may aid in the diagnosis but their clinical value in each case must be critically estimated and not accepted blindly.

Journal d'Urologie Médicale et Chirurgicale, Paris

June, I, No. 6, pp. 737-880

49 *Pyelotomy for Kidney Calculi. P. Bazy.
50 *Roentgenoscopy of the Bladder. (La cystoradiographie.) F. Legueu, Papin and Maingot.
51 *Inflammation of the Verumontanum and Its Direct and Reflex Consequences. (Inflammation du veru montanum.) P. Orlowski.
52 *Asepsis and Infection of Tuberculous Urine. Rafin.
53 *Mode of Onset of Tuberculosis of the Kidney. Rafin.
54 *Epididymectomy for Tuberculosis of Genital Organs. N. Marinesco.

July, II, No. 1, pp. 1-156

55 General Toxicity of Extracts of Enlarged Prostate. F. Legueu and R. Gaillardot.
56 *Descending Infection of the Urinary Passages in Typhoid. A. Lemierre and P. Abrami.
57 *Cystoscopy with Enlarged Prostate. G. Marion.
58 *Obstetric Injury of the Lower Urinary Apparatus. (Troubles de la miction d'origine obstétricale. Destruction et réfection de l'urètre.) A. Guidjoglou.

49. Pyelotomy for Kidney Calculi.—Bazy insists that the pelvis rather than the body of the kidney should be incised to remove concrements. This technic does less damage, causes less operative shock and gives rise to fewer complications, primary or secondary. Radiography will show whether the stone is in the kidney or pelvis; when the inner margin is at least 5 cm. from the median line, the stone is in the pelvis. Stones farther from the axis of the trunk than this are in the kidney. He gives skiagrams of three new instructive cases. The shadow is generally on a level with the third lumbar vertebra or the articulation between the second and third or third and fourth. He does not say that it is possible to remove all kidney stones through the pelvis, but that much more can be done in this line than is generally recognized. Another advantage of pyelotomy is that it allows the pelvis and calices to be flushed out. In the three cases reported the infected urine was soon rendered sterile by this means.

50. Cystoradiography.—The extensive clinical research reported was done mostly with collargol injected into the bladder. A number of cases are illustrated demonstrating the value of the information thus to be derived in cases of malformation, diverticula, tumors, enlarged prostate, rupture of the bladder and bladder calculi.

51. Inflammation of the Crest of the Posterior Urethra and its Direct and Reflex Consequences.—Orlowski ascribes isolated inflammation in this region mainly to sexual anomalies interfering with the normal automatic and immediate reflex constriction of the local vessels. The musculature of the vessel walls and the nerve centers involved become exhausted, and inflammation in the verumontanum is liable to follow. The trouble generally yields promptly to direct local application of 20 per cent. silver nitrate. If there is hypertrophy, a week later he applies the actual cautery, very superficially, once or repeated two weeks later. Retention of urine is combated with hot sitz baths twice a day and a sodium sulphate purge. If more of the posterior urethra is involved, these simple measures would not suffice to cure the affection. The symptoms in one typical case were merely a smarting in the urethra, intermittent and not distinctly localized; this had continued for seven years with an occasional scanty mucopurulent effusion. No benefit was derived from treatment by ten different physicians until the verumontanum was cauterized when all symptoms permanently disappeared. Inflammation of the verumontanum is liable to entail impotency, and he cites cases in which nothing but proper treatment of it restored the sexual functions. The impotency may entail urogenital neurasthenia with disturbances in micturition from cystitis of the neck of the bladder secondary to the conges-

tion of the verumontanum. In five of his cases the neurasthenia had been accompanied by vasomotor disturbances so severe that a cardiac neurosis and dilatation of the heart had been diagnosed. Two of these patients reacted to the local treatment of the verumontanum with an attack of maniacal agitation, but they were cured completely by the local treatment alone; in the three others the results were less favorable, although marked improvement was noted.

52. **Sterility of Tuberculous Urine.**—Rafin found the urine aseptic in seventy-one of 239 tuberculous patients. The bacteria found in tuberculous urine by others are generally due to accidental contamination, so that it may be accepted as a general rule that an aseptic pyuria testifies strongly in favor of tuberculosis.

53. **Onset of Renal Tuberculosis.**—Bladder symptoms were the first to call attention to trouble in 61.87 per cent. of Rafin's 160 patients with tuberculosis of the kidneys. The kidneys themselves caused no revealing symptoms at first in over 80 per cent. Hematuria or turbid urine was the first sign in 5 and 2.5 per cent., general weakness in 2.5, and pain in kidney or bladder with hematuria in 2.62 and 1.87 per cent. Rafin thinks that the kidneys probably had caused early slight symptoms in a larger proportion of cases, but the vague fleeting sensations had been disregarded. In nearly every case he was impressed with the good general appearance accompanying severe tuberculous lesions in the kidney.

54. **Epididymectomy in Genital Tuberculosis.**—Marinesco discusses the history of operative treatment of genital tuberculosis and the indications for it, and reviews the outcome in ninety-six cases in which it was done and thirty-three of the patients reexamined after from one to fifteen years. He gives an illustrated description of the technic and states that a definite cure was realized in twenty-three cases. The lesions in the prostate and seminal vesicles had all healed, and this had occurred the more rapidly in the patients in whom the vas deferens had been most extensively resected. Even after a double epididymodeferentectomy the sexual powers persisted unimpaired.

56. **Typhoid Bacteriuria.**—The elimination of typhoid bacteria by the kidneys seems to be an established fact. This elimination may be accompanied by signs of nephritis as in a patient who had several relapses and at each return of the fever there were intense albuminuria, lumbar pain and hematuria with typhoid bacilli swarming in the urine. As the fever subsided each time the urine returned to normal. Typhoid cystitis may occur with or without appreciable symptoms.

57. **Cystoscopy with Enlarged Prostate.**—Marion's study of this subject is accompanied by twelve illustrations and a colored plate of the findings.

58. **Obstetric Injury of the Urethra.**—Guldjoglou reports several personal cases and summarizes some from the literature—a total of sixteen cases in which practically a new urethra had to be made on account of injury during delivery. He gives an illustrated description of the technic he followed, which proved very satisfactory, and compares it with the others that have been applied. The after-care is of extreme importance and several operations may be needed. (See Abstract 67 below.)

Lyon Médical, Lyons

August 11, XLIV, No. 32, pp. 229-260

59 *Nature of Osteomalacia. (Origine et nature sarcosporidiennes de l'ostéomalacie.) M. Jaboulay.

August 18, No. 33, pp. 261-296

60 Subaortic Stenosis. (Le rétrécissement sous-aortique pur.) Bret and B. Perducet.

59. **Parasitic Origin of Osteomalacia.**—Jaboulay concludes from histological study of a case of osteomalacia, beginning with a simultaneous fracture of the left humerus and femur in 1905, and terminating in death in 1908, that it is an infectious disease caused by the group of protozoa known as sarcosporidia. The new growth caused by these organisms results in the so-called spontaneous fractures so common in this disease. Treatment, therefore, should be by measures destructive to protozoa.

Presse Médicale, Paris

August 24, XX, No. 69, pp. 701-712

61 *Etiology of Scarlet Fever. (Les travaux récents sur l'étiologie de la scarlatine.) C. Levaditi.

62 Organotherapy of Backward Children. (Les enfants "arriérés.") R. Dupuy.

August 28, No. 70, pp. 713-720

63 Ischemic Contracture. (Ce que le médecin doit savoir de la rétraction musculaire ischémique.) A. Binet.

64 Echinococcus Disease of the Fourth Ventricle. (Cysticercose du quatrième ventricule cérébral.) H. J. Cazeneuve and G. Laurès.

61. **Scarlet Fever.**—Levaditi gives an oversight of what has been accomplished to date in the transmission of scarlet fever to monkeys and anthropoid apes. The latter are more susceptible and develop a disease closely resembling scarlet fever in man when they have been inoculated with the virus. The nature of the virus is still unknown, but it seems to be present in the tonsils, tongue, blood, lymph-nodes and pericardial fluid. He gives illustrations of the positive findings in an orang-outang inoculated with the virus at the Paris Pasteur Institute.

Revue Pratique d'Obstétrique et de Gynécologie, Paris

July, XX, No. 7, pp. 193-220

65 *Shoulder Presentation. (Des présentations irréductibles de l'épaule.) G. Ziegelmann.

66 Ferric Chlorid Test for Acidosis in Vomiting of Pregnancy. (L'urodiagnostic et uropronostic des vomissements graves de la grossesse par le perchlorure de fer.) V. Le Lorier.

August, No. 8, pp. 221-252

67 *Obstetrical Injury Interfering with Micturition. (Troubles de la miction d'origine obstétricale. Destruction et refection de l'urèthre chez la femme.) A. Guldjoglou. Commenced in No. 6.

68 Ovarian Cyst with Pregnancy; Three Cases. (Kystes de l'ovaire ou du parovaire et grossesse.) J. Vanverts.

65. **Irreducible Shoulder Presentation.**—Ziegelmann warns that rupture of the uterus may occur even with gentle maneuvers, and that the obstetrician should always be prepared to do a hysterectomy in cases of impacted shoulder presentation. If embryotomy is required, the head may be left behind. The entire urogenital apparatus should be carefully investigated after embryotomy to be sure that no injury has been accidentally done to the walls.

67. **Pregnancy or Obstetrical Injury Interfering with Micturition.**—Guldjoglou emphasizes that it is important during the pregnancy to be on the lookout for disturbances in micturition and ward off the complications liable to result when there is retention of urine and the uterus is in retroversion. In case there is incontinence from the urethra's being insufficient, its lumen should be made narrower or its curve made sharper or a resistant support for it be provided in some way. Sixteen cases are summarized from the literature to show the different technics that may be applied in case of obstetrical destruction of urethral tissue and the indications for them. Unduly prolonged pressure from the head is generally responsible for both functional and destructive injury of the urethra, so the accoucheur should be on the alert to avert this. The article is about the same as that by the same author mentioned in Abstract 58 above.

Semaine Médicale, Paris

September 4, XXXII, No. 36, pp. 421-432

69 Rôle of the Gonococcus in the Origin of Pyosalpinx. R. de Bovis.

Berliner klinische Wochenschrift

August 19, XLIX, No. 34, pp. 1597-1644

70 Gout. (Diagnose, Wesen und Behandlung der Gicht.) T. Brugsch.

71 *Acromegaly with Enlargement of Intestinal Organs. (Zur Lehre der Splanchnomegalie bei Akromegalie.) C. Amsler.

72 The Growth of Cells. (Ueber Zellenwachstum.) A. Adamkiewicz.

73 *Chemotherapy. (Zur Frage der "rationellen" Chemotherapie.) A. Sternberg.

74 Diarrhea after Hormonal; Three Cases. (Ueber Hormonaldurchfall.) W. Kausch.

75 Roentgenotherapy in Gynecology. M. Fränkel.

71. **Acromegaly with Splanchnomegaly.**—Amsler compares his case with two reported in 1906 by Löwenstein. His patient was a man of 41 with a hypophysis tumor, acromegaly and hyperplasia of the spleen, kidneys and pancreas, heart, adre-

nals and liver, the latter three showing also some hypertrophy. Diabetes developed in the course of the acromegaly. He discusses the possible mechanism of the various elements of the syndrome, remarking that the hypophysis may be responsible for idiopathic hypertrophy of the heart in certain cases. It is even possible that the hypophysis has something to do with the development of arteriosclerosis and arteriosclerotic contracted kidney. In future greater attention should be paid the hypophysis in these conditions, examining it under the microscope and also examining the adjoining region, as aberrant hypophysis tissue is sometimes found in the sphenoid bone and upper pharynx wall.

73. **Rational Chemotherapy.**—Sternberg theorizes to explain why no substance of the nature of tuberculin can be detected in the sputum, serum or effusions of tuberculous patients. Tuberculin may be regarded as an artificially produced aggressin. Reasoning from these premises he has been utilizing tuberculin as an elective vehicle to transport drugs to the disease process. He explains the focal tuberculin reaction as the result of activation of the tubercle bacilli in the focus by the tuberculin, which is an aggressin-body The logical therapeutic preparation therefore would be one that contains as little as possible of the tuberculin vehicle, no more than would be neutralized by the antibody on hand; this would permit the drug for which it is serving as a vehicle to exert its powers uninterfered with. His research indicates that tuberculin from bovine or fowl tuberculosis might prove most effectual, as they have a pronounced affinity for local tuberculous processes although the reaction they induce is minimal.

Correspondenz-Blatt für Schweizer Aerzte, Basel

August 20, XLII, No. 24, pp. 889-920

76 Endovesical Operations. (Leistungsfähigkeit endovesikaler Operationsmethoden.) F Suter.

September 1, No. 25, pp. 921-968

77 Congenital Dropsy (Hydrops universalis neonati mit komplizierender kongenitaler Mitralstenose.) E. Ludwig.
78 Peculiar Case of Carbon Monoxid Poisoning. (Kohlenoxydvergiftung.) P. Deus. Commenced in No. 24.
79 Intramuscular Etherization. (Die intramuskuläre Aetherisierung.) Dumont.

Deutsche medizinische Wochenschrift, Berlin

August 15, XXXVIII, No. 33, pp. 1521-1576

80 *Arteriosclerosis. H. Hochhaus.
81 Electrocardiography. (Die klinische Bedeutung des typischen Kammer-Elektrokardiogramms.) A. Hoffmann.
82 *Causes of Emphysema. (Zur Pathogenese des Lungenemphysems.) L. Hofbauer.
83 *Tubercle Bacilli in the Blood. (Tuberkelbazillen im strömenden Blute.) P. Ranström.
84 *Sulphur Reaction in the Urine with Cancer. (Untersuchungen über den Wert von Saxls Schwefelreaktion bei Karzinom in den Verdauungsorganen.) O. V. C. E. Petersen.
85 *Diagnostic Importance of Chondroitic Acid in the Urine. (Chondroiturie und fakultative Albuminurie.) H. Pollitzer.
86 *Detection of Scanty Helminth Ova in Stool. (Ein neues Verfahren zur Auffindung spärlicher Parasiteneier in Faeces.) S. Yaoita.
87 Present Status of Treatment of Congenital Dislocation of the Hip Joint. (Behandlung angeborener Hüftverrenkungen.) Joachimsthal.
88 Operations on Common Bile Duct. (Statistisches über 367 Choledochotomien.) A. Brüning.
89 *Postural Prophylaxis of Complications on the Part of the Lungs after Operations. (Ueber prophylaktische Hochlagerung und Lagewechsel nach Operationen.) A. Wagner.
90 Poisoning from Food Suggesting Focal Cerebral Disease. O. Meyer.

August 22, No. 34, pp. 1577-1624

91 Thrombosis. H. Ribbert.
92 Improved Technic for Immunization Against Trypanosomes. II. (Neues Immunisierungsverfahren gegen Trypanosomen-Infektionen.) C. Schilling.
93 *Diphtheria Bacilli in the Urine. (Absonderung von Diphtheriekeimen durch den Harn.) H. Conradi and Bierast.
94 Action of Mercurial Preparations on Spirochetes. (Untersuchungen über die Wirkung von Quecksilberpräparaten auf Spirochätenkrankheiten.) W. Kolle, M. Rothermundt and S. Peschlé.
95 Anaphylactoid Phenomena After Repeated Injection of Salvarsan. O. Brückler.
96 Combination of Drugs. (Kombination von Arzneimitteln.) M. Kochmann.
97 Vaccine Treatment of Hay Fever. (Die immunisatorische Behandlung des Heufiebers nach Wright.) H. Ellern.
98 Paroxysmal Dilatation of Large Arteries. (Ueber paroxysmale Erweiterung grosser Arterien.) E. Schlesinger.
99 Bolus Alba as Aid in Surgical Disinfection. (Bakteriologische Untersuchungen über Händedesinfektion nach der "Bolusmethode Liermann.") Küster and A. Geisse.
100 Fracture of the Femur with Contracture of the Knee. (Weiterer Beitrag zur typischen Oberschenkelfraktur bei Knochenatrophie und Kniegelenkskontraktur.) R. Hagemann.
101 *Early Diagnosis of Pulmonary Tuberculosis. Schultes.

80. **Treatment of Arteriosclerosis.**—Hochhaus emphasizes anew the supreme importance of removing the cause, or at least attenuating it, mentioning alcohol, tobacco, coffee, gout, diabetes or nephritis as possible causes and a too strenuous life with inadequate periods of rest. Suggestion to reassure the frightened patient is also important, and he urges to refrain from calling the trouble calcification of the arteries; this term seems to have a peculiarly depressing influence on patients as it implies irreparable changes. Mild hydrotherapy is useful and cautious Swedish exercises and massage. If the heart action seems to be insufficient, he gives small doses of digitalis, sometimes for months and years, his prescription calling for the pulverized leaves and quinin sulphate, *aa* 1.5 gm., to be made into thirty pills, three of which are to be taken during the day. If there are accompanying subjective symptoms on the part of the heart, he gives in addition valerian or bromids with cold applications to the heart region. He remarks in conclusion that arteriosclerosis does not require treatment, especially in the elderly, unless it is causing actual disturbances.

82. **Origin of Emphysema of the Lung.**—Hofbauer says that the one factor common to all the various causes to which pulmonary emphysema is generally attributed, is that these causes all induce exaggeration of inspiration, while expiration remains the same as usual. Too much air is taken in for the amount expelled, and emphysema results from the excess of residual air.

83. **Tubercle Bacilli in the Blood.**—Ranström claims to have found tubercle bacilli in the blood of nine out of twenty-nine patients in the third stage of tuberculosis. In this group of nine the temperature was irregularly and intermittently febrile, and eight of these patients died within a year. None of the afebrile patients had tubercle bacilli in the blood.

84. **Sulphur Reaction in Urine with Cancer.**—Petersen obtained a positive reaction in two of twenty-seven non-malignant cases, in thirteen of twenty cancer suspects, and in all but two of his nineteen cases of cancer. The contradictory findings were explained by cirrhosis of the liver in the two positive non-cancer cases, and by the concomitant severe jaundice in the two negative, certain cancer cases. These findings confirm anew the value of the test for cancer in the gastro-intestinal canal. (The technic was described in THE JOURNAL, Aug. 31, 1912, p. 738.)

85. **Chondroitic Acid in the Urine as Delicate Sign of Kidney Disease.**—Pollitzer calls attention to an excess of chondroitic acid in the urine as the earliest sign of a kidney lesion. It may be observed before even the microscope can detect anything pathologic. Chondroitic acid occurs in all varieties of cartilage, and in minute amounts is a normal constituent of the urine. It is one of the most active albumin-precipitating acids known. Acetic acid sets it free from its combinations in the urine, effusion or sputum, and at once any albumin present is rendered evident by the immediate turbidity of the fluid which follows. There are always traces of serum albumin in the urine and this is the cause of the minimal turbid cloudiness of the urine on addition of acetic acid in case of chondroitic aciduria. If the urine is shaken up with chloroform this removes the albumin and there is no further turbidity on addition of acetic acid, although the chondroitic acid is still present. But addition then of even a minute amount of albumin restores the opalescence. The chondroitic acid may not respond to the acetic acid because there is too little albumin present or because there is so much albumin that the chondroitic acid is choked, and the test does not become positive until most of the albumin has been removed. Permanent chondroiticaciduria is the rule, Poliitzer asserts, in individuals with orthostatic, "facultative" albuminuria, and it seems to occur regularly in the triad of coccus infections, acute articular rheumatism, endocarditis and chorea, which most clinicians now trace to chronic tonsillitis. The chondroiticaciduria with febrile tonsillitis preceded the albuminuria in the cases he examined and persisted long after the subsidence of the latter and of the angina. The chondroiticaciduria was very pronounced in his endocarditis cases, especially in the dragging septic type. It

may thus be regarded as the manifestation of damage of the kidney, for which chronic tonsillitis is generally responsible, although it is liable with other infections, typhoid, etc. He has never found the chrondroitic acid in the blood, but it is found locally in destructive inflammatory processes. It was very abundant in the effusion in one case of severe polyserositis although the urine had only the normal proportion. Chondroitic acid is probably the essential agent in the Rivalta acetic acid test for albumin in the sputum, as a sign of its tuberculous inflammatory character.

86. **Scanty Ova in Stools.**—Yaoita uses a strongly alkaline solution of sodium hypochlorite with an equal amount of ether; this mixture rapidly disintegrates food particles while not appreciably affecting the ova. The latter settle in the tip of the centrifuge glass.

89. **Postural Prophylaxis of Postoperative Complications.**—Wagner protests against waiting for complications to develop before raising the patient's shoulders. He thinks this should be done systematically after all major operations, whether done with general or local anesthesia. He generally raises the head of the bed four to sixteen inches and he has not lost a patient from postoperative pneumonia since he has been doing this. Children are particularly grateful for being allowed to partly sit up, and young and old benefit alike. He raises the foot of the bed when there has been much loss of blood, and states that nothing else has such a marked influence in bringing the pulse up, sometimes accomplishing this when stimulants and infusion have all failed. In case of postoperative paresis of the bowel, turning the patient from his back on his side will often work wonders. A change of position is also often of supreme benefit in case of dilatation of the stomach and distention with air. The foot or head of the bed can be raised with the patient lying prone. This proved particularly effectual for a large abscess in the mediastinum. The abscess was drained and it promptly healed as the patient lay on his stomach with the foot of the bed raised. In no other position would it have been possible to prevent the spread of the pus inside.

93. **Diphtheria Bacilli in the Urine.**—Conradi and Bierast found scanty diphtheria bacilli in the urine in fifty-four of 155 diphtheria patients or convalescents examined. In thirty-two of the fifty-four positive cases the urine was from men or boys. In one case the bacilli were found seven weeks after the boy of 7 had apparently entirely recovered from diphtheria lasting two weeks. The bacilli were always few and far between, but the findings impose the necessity for disinfecting the urine of diphtheria patients. The facts cited may throw light on the development of pseudomembranous colpitis, gangrenous vulvitis and diphtheric skin affections. Infected urine might also prove a source of contamination of milk.

101. **Early Diagnosis of Tuberculosis.**—Schultes insists that the general and febrile reaction to subcutaneous injection of tuberculin is decisive only when râles develop at the same time at the apex. Large doses are less instructive than those of 5/100 or 5/10 of a milligram. On suspicion of neurasthenia, the large doses should be avoided with special care as they are liable to do much harm in the neurasthenic.

Jahrbuch für Kinderheilkunde, Berlin

August, LXXVI, No. 2, pp. 125-246

102 Starch Dyspepsia in Infants. (Zur Pathologie des Mehlnährschadens der Säuglinge.) B. Salge.
103 *School as a Factor in Epidemic Poliomyelitis. (Schule und epidemische Kinderlähmung.) J. Langer.
104 Case of Traumatic Pseudomeningocele Combined with Internal Hemorrhagic Pachymeningitis. R. Schindler.
105 Calcium and Phosphorus Metabolism on Cow's Milk. (Ueber den Kalk- und Phosphorsäurestoffwechsel des Säuglings bei knapper und reichlicher Ernährung mit Kuhmilch.) G. Wolff.
106 *The Eruption in Measles, and Its Transmission. (Ueber Masernexanthem und Masernübertragung.) E. Goetze.

103. **School as a Factor in the Spread of Epidemic Poliomyelitis.**—Langer reports a study of poliomyelitis in the schools at Steiermark. In addition to his own cases he obtained detailed information from the teachers in regard to all cases reported during the epidemic of 1909. He concludes that the school is a source of infection, and that all possible prophylactic measures should be taken to avoid the spread of the disease in this way. In support of this conclusion he mentions that he had sixty cases during the school year and only thirty-seven during vacations. Where there were several cases in different classes in the same school, twelve times there were two cases in the same class, twice, three cases and once five cases. In six schools the patients were seat-mates and in ten classes only children of the same sex were affected (seven times only girls, three times only boys). In the majority of cases it was found that the children went to and from school together or were closely associated in their daily life. Some children were taken sick in classes where there had been no previous cases, but they had been visited by the brothers or sisters of patients. On the other hand, in some instances there was only one case in a school or a class, though on account of the lack of knowledge of the disease no quarantine precautions had been taken. Where there were several cases in a class, the time between them was occasionally even longer than six weeks; in a few instances two cases occurred at the same time, showing that there must have been some outside source of infection. At the time of the school epidemics there were also cases among the children of the neighborhood outside of school. He gives detailed reports from twenty-one schools.

106. **The Eruption of Measles.**—Goetze concludes that the eruption is only a symptom, not peculiar to measles, but occurring in many other infectious diseases. He cites cases from Lührmann, Schilling, Kartulis, F. Müller and other authors of exanthemata very similar to that of measles, occurring in dengue, bilious typhoid, Rocky Mountain fever and other infections. He has found that measles can be transmitted to hogs. In animal experimentation the injection of the virus of measles causes marked changes in the pulse and temperature curves during the prodromal period. Seven curves are given.

Medizinische Klinik, Berlin

August 18, VIII, No. 33, pp. 1339-1374

107 The Ear and Acute Infectious Diseases. R. Eschweiler.
108 Thermal Baths and Hemorrhage. (Blutungen und mässigwarme Thermalkuren.) W. Schulhof.
109 Calcium Metabolism During Digestive Disturbances. (Der Kalkstoffwechsel bei Verdauungsstörungen.) Krone.
110 Disadvantages of Plugging the Frontal Sinus. (Empfiehlt sich die Plombierung der Stirnhöhle nach Citelli?) Engelhardt.
111 Measuring Distance Between the Pupils. (Weiterer Beitrag zur Bestimmung des Pupillarabstandes.) R. Helmbold.
112 Anaphylaxis, Non-Coagulation of the Blood and Ferment Toxicity. (Ueber Anaphylaxie, Ungerinnbarkeit des Bluts und Fermentgiftigkeit.) G. Salus.

August 25, No. 34, pp. 1375-1412 and Supplement

113 Present Status of Serotherapy in Streptococcus Infections. F. Heimann.
114 General Paralysis. (Diagnose und Differentialdiagnose der progressiven Paralyse.) M. Arndt.
115 *Causal Treatment of Diabetes. C. Funck. Commenced in No. 33.
116 Lime Contents of Mineral Waters. (Kalkgehalt unserer Mineralwässer.) C. Schütze.
117 *Antitrypsin Test for Cancer. (Diagnostische Bedeutung des Antitrypsingehalts des Blutserums beim Krebs und bei anderen Erkrankungen.) A. Citronblatt.
118 Treatment of Anthrax. (Behandlung des äusseren Milzbrandes.) B. Pericic.
119 Action of Gelatin by the Mouth on the Viscosity of the Blood. (Die Wirkung der internen Darreichung der Gelatine auf die Viscosität des Bluts.) E. Cmunt.
120 Experimental Bacteriologic Research on Action of Dermatologic Applications. (Beeinflussung des Bakteriengehalts der Haut durch dermatologische Behandlungsprozeduren.) S. Hidaka.
121 Results of Modern Orthopedics. M. Böhm.

115. **Causal Treatment of Diabetes.**—Funck expatiates on the progress that will be realized when the individual cases of diabetes are studied to determine the predominating factors in the disease. The evidence to date points to a constitutional inferiority of the glands in charge of carbohydrate metabolism—particularly the pancreas. The pathologic factor responsible for this inferiority may act on these glands directly or indirectly by inhibiting the vicarious action of certain other organs or functions. This predominating primary factor was a chronic catarrhal bowel trouble in one of the cases cited; the patient was a woman of 38 with symptoms of diabetes and neurasthenia and diarrhea for about two years. Under a course of treatment for the bowel trouble,

in eighteen days the sugar in the urine dropped from 200 per day to zero and has not returned during the year since although there have been no restrictions in the matter of diet. Funck calls attention to the information liable to be obtained by examining the urine voided at different parts of the day. Curves may thus be obtained which suggest a clue to the primary factor. In one case the sugar output seemed to be due to a reflex act elicited after each meal by the presence of food in the stomach. The proportion of sugar at 10 a. m. was 0.4 per cent. Fifteen minutes after dinner there was sudden desire to urinate and the proportion of sugar gradually increased to 1.1 per cent. by the third hour. Examination four years before had shown 2.6 per cent. in the total urine. The patient was a man of 46 and after a course of feeding exclusively by the rectum, to avoid the reflex influence from food in the stomach, he was freed entirely from the glycosuria. Now, nearly a year later, he can eat starchy foods and nearly a quart of milk a day, up to 2,300 calories, without any further sugar in his urine. In the third case the diabetes accompanied in a child of 2 an inherited, almost absolute, insufficiency of the digestive apparatus. Achylia gastrica is not unusual in diabetics. In some cases the metabolism may be upset by an excessive protein diet; in others the tendency to diabetes remains latent until aroused by some excess in eating and exacerbation of an old colitis, for example, as in a case described. There was usually complete tolerance for carbohydrates, but three or four days after a banquet from 0.2 to 0.4 per cent. sugar was found in the urine voided after dinner. Large doses of tannin, rinsing out the intestines and a frugal starch "colon diet," with abstention from meat for three or five days, put an end to the glycosuria each time. Others have recently reported the permanent subsidence of glycosuria under lavage of the stomach, dietetic treatment of enteritis, treatment of neurasthenia, salvarsan treatment of a syphilitic pancreatitis with 5.4 per cent. sugar, or thyroid treatment or treatment of uricacidemia. We have no criterion as yet to determine whether the diabetes is still in its first stage, that is, still amenable to treatment directed to removing the cause. After this stage is past, then the ordinary measures in vogue are applicable alone. The only safe way is to take it for granted that the diabetes is still in the first, curable stage and spare no pains to discover the causal factor in the digestive tract, liver, sympathetic system, thyroid or epinephrin-producing glands.

117. **Proteolytic Test for Cancer.**—Citronblatt reports positive findings with the antitrypsin test (Brieger) in 90 per. cent. of ninety-nine cancer patients, in two typhoid and in two gall-stone cases; negative in the numerous controls.

Monatsschrift für Kinderheilkunde, Leipsic

July, XI, No. 3, pp. 93-140

122 *Pleural Empyema in Infants. (Zur Klinik und Therapie des Pleuraempyems bei Säuglingen.) F. Zybell.
123 Salt Fever. (Ueber das sogen. Kochsalzfieber.) S. Samelson.
124 Experimental Research on Dogs in Regard to Action of Sugar. (Untersuchungen am Hunde über die Wirkung des Rohr- und Milchzuckers.) P. Heim.

122. **Pleural Empyema in Infants.**—Zybell reports twenty-two cases of empyema, only three of which were in children over 1 year old, the oldest being 15½ months. He cites further 145 cases from Nathan, 32 per cent. of which were during the first year and 21 per cent. during the second year of life. Lewis Smith observed thirty-nine cases, 36 per cent. of them in infancy. The physical findings are not typical as they are in adults, and the only reliable means of diagnosis is by puncture. As it is entirely without danger in the youngest children, he declares, it should be resorted to in every doubtful pulmonary case. Even then errors may be made as the trocar may enter a purulent focus in the lung itself. In infants the pyogenic process shows a marked tendency to extend to the lungs and to other serous membranes. In fifteen of the twenty-two cases there were complications of this kind: in seven a purulent pneumonia, in two each purulent pericarditis, dry perisplenitis or purulent arthritis; in four purulent otitis media, and in five general furunculosis and deep-seated abscesses. In several cases two or more of these complications were combined. The mode of onset is variable, sometimes very sudden, sometimes quite chronic. The most marked respiratory symptom is dyspnea, sometimes accompanied by a harsh dry cough and frequently by cyanosis, mild or severe in degree. Frequently, however, the respiratory symptoms are less pronounced than alimentary—loss of weight and appetite, vomiting and diarrhea. These with slight or negative physical findings frequently lead to errors in diagnosis. Neither is there any typical temperature curve. In three of these cases the temperature curve was practically normal throughout and in two others only moderately elevated. The height of the temperature is no index to the severity of the infection. The weight curve is more reliable (five temperature and weight curves are given). The infecting organism in the majority of cases was the pneumococcus. Three cases showed streptococci and one a mixed infection of streptococci and staphylococci; one case was tubercular. In adults, rib resection is the best operative procedure, but in infants it shows an appallingly high mortality. Zybell has collected eighty-two cases in infants under 1 year from the literature, seventy-two of which were fatal; in older children, eighty-four cases with sixty-three deaths. Simple puncture repeated as often as necessary he considers the best measure. He has collected thirty-one cases from the literature with twenty-seven recoveries. Of his own twenty-two cases, one was discovered only at necropsy. In two cases rib resection was done; both infants died. In five cases the empyema was drained by passing a rubber drain through a trocar. One of these infants recovered. One was punctured and the focus washed out with salt solution. This patient died, and he thinks the washing was partly responsible for the death. Thirteen patients were simply punctured. Two of these were in a practically moribund condition on entrance. Six of the other eleven recovered.

Münchener medizinische Wochenschrift

August 20, LIX, No. 34, pp. 1841-1888

125 *Combined Treatment of Cancer. (Behandlung und Heilung von Krebskranken durch innerlich und äusserlich angewendete medikamentöse Mittel.) A. Zeller and V. Czerny. Concluded in No. 35.
126 *Inflation of Rectum as Aid in Diagnosis of Latent Appendicitis. (Zur Diagnose der chronischen bezw. Intervall-appendizitis.) L. Dreyer.
127 Advantages of Raising the Pelvis as Aid in Version and Other Obstetrical Measures. H. H. Schmid.
128 Advantages of Primary Ether Anesthesia in Obstetrics. (Aetherrausch.) H. H. Schmid.
129 *Local Anesthesia and Agraffes for Suturing Perineal Tears. (Dammnaht.) H. H. Schmid.
130 *Connection Between Early Rising After Childbirth and Dyspepsia in Infants. H. H. Schmid.
131 *Carbonated and Oxygenated Baths for Infants. H. H. Schmid.
132 Technic for Roentgen Irradiation. (Vergleichsversuche mit Röntgeninstrumentarien.) E. Hergenhahn.
133 Protest Against Kehr's Criticism of Certain American Surgeons. (Einiges zu dem Artikel von Prof. Dr. Hans Kehr: "Ueber Duodenalgeschwüre.") F. Trendelenburg.
134 *Epidemic Appendicitis. (Epidemiologisches zur Appendizitis.) O. Lanz and German.
135 Experiences with Salvarsan. G. L. Dreyfus. Commenced in No. 33.
136 Roentgenoscopy of Action of Purgatives on Intestines. (Roentgenuntersuchungen über den Einfluss der Abführmittel auf die Darmbewegungen des gesunden Menschen.) F. Meyer-Betz and T. Gebhardt.

125. **Combined Non-Operative Treatment of Cancer.**—Zeller's work in this line was described in the Berlin Letter in THE JOURNAL, Sept. 7, 1912, p. 815.

126. **Inflation of Rectum as Aid in Diagnosis of Latent Appendicitis.**—Dreyer inflated the rectum with air in three cases with a history of recurring mild appendicitis but with no tenderness or other sign suggesting chronic trouble in the intervals. The gradual inflation caused no symptoms at first, but as the air made its way upward in the bowel and reached the region of the appendix, the patients began to complain at once of pain around the umbilicus and in the cecum region, the sensations similar to those during their previous inflammatory attacks or the pain brought on by horseback riding. Inflation of the rectum in some other patients free from any tendency to appendicitic trouble failed to elicit any sensations. This rectum inflation method may serve also in the study of the sensitiveness of the viscera.

129. **Technic for Suturing Perineal Tears.**—Schmid extols the advantages of the Braun technic for local anesthesia, suturing in tiers and using clips instead of suturing the skin.

130. **Connection Between Early Rising and Infant's Dyspepsia.**—Schmid found that the infants began to have digestive disturbances as soon as the mother was allowed to leave the bed. He found the explanation of this to be that the mothers took up the child whenever it cried and let it nurse, instead of feeding it only at regular intervals as is the rule when the mother is kept in bed. It is such a serious handicap to an infant to get digestive disturbances before it is a week old, that Schmid has now given up the advantages for the women of early rising to save the infants from the consequences of the mothers' heedlessness which he has found it impossible to control. As soon as the nurse's back is turned the mother is liable to feed her babe anew.

131. **Carbonated Baths for Infants.**—Schmid has found carbonated or oxygenated baths useful as a means of applying stimulation to the skin of prematurely born and other weakly infants.

134. **Epidemic Appendicitis.**—Lanz reports three instances in which an epidemic febrile streptococcus sore throat was followed by the simultaneous occurrence of two or three cases of appendicitis in the same family. German reports three recent cases in which the appendicitis seemed to coincide with the angina. In Lanz' cases the streptococcus was cultivated from the appendix, and he urges the necessity for prophylactic purging in every case of febrile sore throat. Appendicitis following the latter or of traumatic origin seems to display a special tendency to gangrene, and trauma is certain to cause perforation if the appendix was not entirely sound before the accident.

Wiener klinische Wochenschrift, Vienna

August 22, XXV, No. 34, pp. 1279-1310

137 *Operative Treatment of Pulmonary Tuberculosis. J. Sorgo.
138 Fracture of the Larynx; Two Cases. Advantages of Tracheotomy. (Ruptur der Trachea und Perforation des Oesophagus bei Larynxbrüchen.) H. Koerbl.
139 Perforation of Cheesy Lymph-Node Into Aorta First Manifestation of Tuberculosis. (Durchbruch einer verkästen Lymphdrüse in den Arcus aortæ.) K. Bauer.
140 Acute Somnambulism from Toxins Absorbed from Undiagnosed Dental Periostitic Process. R. Goldmann.

August 29, No 35, pp. 1311-1342

141 *Benzol in Treatment of Leukemia. G. Kiralyfi.
142 Hog Cholera in Man. (Schweinerotlauf beim Menschen.) G. Günther.
143 *Autohemotherapy in Cancer. (Aus dem Gebiete der Krebsforschung. II.) A. Krokiewicz.
144 Conjugal Cancer. (Zur Berechung des Cancer à deux.) S. Rosenfeld.

137. **Operative Treatment of Pulmonary Tuberculosis.**—Sorgo dismisses as not having proved their usefulness all operative measures except artificial pneumothorax and thoracoplastics. These alone seem to have a future, judging from the experiences to date. He has applied the therapeutic pneumothorax in forty-five cases of pulmonary tuberculosis, and is convinced that this is the most effectual operative procedure known to date and that its application is justified in all cases of severe unilateral phthisis. The great trouble with it seems to be that the other lung is rendered less resistant. He found that patients constantly lost weight under the artificial pneumothorax, and this in turn had an unfavorable action on the other lung. The main point consequently in this compression treatment of the lung is to ascertain that the other lung is sound or at least that any process in it is mild, restricted to the apex and displaying a benign tendency. The outcome seems to depend entirely on this lung.

141. **Efficacy of Benzol in Leukemia.**—Kiralyfi gives the experiences to date with this method of treatment inaugurated by Koranyi not long ago. (Koranyi's first report on the subject was summarized in THE JOURNAL, Aug. 31, 1912, p. 755.) Seven patients with leukemia have now been given systematic benzol treatment. It is prescribed with equal parts olive oil, 1 gm. of the mixture in each capsule. Four capsules a day are taken at first, increasing to two capsules five times a day. The leukocytes return to normal numbers and the leukemic lesions subside. In some of the cases reported, the leukocytes dropped from 300,000 to 8,000 under the benzol when nothing else previously, not even Roentgen ray exposures, had had any influence on their numbers. The other symptoms of leukemia subsided likewise. The course of treatment varied from three weeks to five months, the age of the patients from 21 to 69. The results of benzol treatment in a case of polycythemia suggest that possibly it may prove able to regulate the blood production in this affection also. The interval since in all the cases has been too short to determine whether the cure is permanent. The leukemia was mostly of the myeloid type. In the one lymphatic case, the benefit was apparent exceptionally early, the leukocytes dropping to 7,200 in three weeks from 131,200 at first. A year before, under twenty exposures to the Roentgen rays, the leukocytes dropped from 80,000 to 40,000 but the lymph-nodes grew larger. One woman responded atypically to the benzol; the leukocytes were at first 140,000 and declined only to 100,000 under three weeks of benzol treatment. It was then suspended and the leukocytes increased in five days to 290,000 and then dropped in ten days to 65,000 and in fifteen more to 15,000. The other symptoms of leukemia showed marked benefit from the start; the fever and enlargement of the spleen soon subsided.

143. **Autohemotherapy in Cancer.**—Krokiewicz reports thirteen cases of cancer in which he drew 6 c.c. of blood from the median vein and reinjected it at once into the subcutaneous tissue in the chest, repeating the procedure at eight or ten day intervals. In the advanced cases the pains and vomiting were favorably influenced; the patients slept and ate better and regained more energy. In some cases the general condition took a marked turn for the better. This was especially marked when this autohemotherapy was applied after excision of the cancer. Convalescence seemed to be materially promoted.

Zeitschrift für Kinderheilkunde, Berlin

August, IV, No. 5, pp. 365-450

145 Tendency to Lithiasis in Children in Hungary. (Die infantile Lithiasis in Ungarn.) J. v. Bokay.
146 *Dangers of Piercing the Ears for Earrings. (Das Ohrringstechen und seine Gefahren, insbes. die tuberkulöse Ansteckung der Stichöffnungen.) A. Epstein.
147 Research on Rachitis. (Was lehrt mein Rachitismaterial?) R. Fischl.
148 *Clinical Diagnosis of Latent Inherited Syphilis. A. Goldreich.
149 Eruptions Following Vaccination. (Zur Pathologie vaccinogener Ausschläge.) G. Nobl.
150 Nutritive Value of Milk Sugar. (Der Nährwert des Milchzuckers.) M. Calvary.

146. **Tuberculous Infection From Piercing the Ears.**—Epstein reports in detail two cases of infants with tubercular infection of the ear and enlargement of related lymph-nodes; one was 9 weeks old, the other 4 months. Both had had their ears pierced for the wearing of earrings, when a few days old, by the midwife. He cites eleven other cases from different authors of tuberculosis of the lobe of the ear, probably caused in the same way. All had had their ears pierced in infancy.

148. **The Diagnosis of Latent Hereditary Syphilis.**—Goldreich reports 130 cases of hereditary syphilis examined by him, showing what stigmata were present and the results of the Wassermann reaction. The Wassermann reaction was positive in 67 per cent. of the cases. A sign which he considers of great importance is the enlargement of the epitrochlear glands. This was present in 80 per cent. of all the cases; in children under 6 years of age in about 90 per cent., while in the non-syphilitic cases he found only 15 to 17 per cent. with enlarged glands. He found fifteen cases of hydrocephalus, forty-seven cases of "saddle nose," and thirty-two cases with characteristic fissures at the angles of the mouth; only three cases of Hutchinson teeth were discovered.

Policlinico, Rome

September 1, XIX, No. 36, pp. 1297-1330

151 Indications for the Mastoid Operation. (Sul momento di operabilita delle osteomieliti acute parziali della mastoide.) T. Mancioli.

Riforma Medica, Naples

August 10, XXVIII, No. 32, pp. 869-896

152 Bacillus Carriers in Epidemiology of Malta Fever. (Influenza dei portatori di germi nella diffusione della febbre mediterranea.) A. Missiroli.
153 Operative Cure of Congenital Fistula in the Neck. G. De Francisco.

August 17, No. 33, pp. 897-924

154 Experimental Research on Atheromatous Degeneration of the Aorta. (Ricerche sperimentali sulla genesi dell' ateroma aortico e sulle alterazioni del miocardio da esso dipendenti.) C. Farmachidis.

155 Long Clinical Course and Necropsy Findings in Case of Hemorrhage in the Pons. (Caso di emorragia protuberanziale.) U. Gasperini. Commenced in No. 32.
156 Helminths in Relation to Cholera. (La Simbiosi elmintica nel quadro nosologico del colera asiatico.) A. Di Vestea.

Revista de Medicina y Cirugia, Havana

(August 10, XVI, No. 15, pp. 417-442

157 Classon Disease. (Caisson Disease o parálisis de los buzos.) R. Perez-Vento.
158 Prophylaxis of Epidemic Cerebrospinal Meningitis. J. F. Arteaga.
159 The Bubonic Plague in History and Literature. (Episodio sobre la peste.) L. M. Cowley.

August 25, No. 16, pp. 443-472

160 *The Sanitary Condition in Cuba. J. Guiteras.
161 What is Death? (Pallida mors.) J. B. Pons.

160. **The Sanitary Condition in Cuba.**—Guiteras replies to a statement made in congress by Senator Foss in regard to the sanitary condition of Cuba. A letter from Guiteras on the eradication of plague in Cuba was published recently in THE JOURNAL, p. 668.

Semana Medica, Buenos Aires

July 11, XIX, No. 28, pp. 49-96

162 *Goat Serum in Treatment of Lupus. (Caso de lupus vulgar tratado con suero normal de cabro.) A. S. Lagomarsino.
163 Congestion of the Lungs. (Sobre la fluxion de pecho. J. Lardieres.

July 18, No. 29, pp. 97-148

164 *Separation of the Upper Epiphysis of the Humerus. (Desprendimientos epifisarios de la extremidad superior del humero.) J. M. Jorge.
165 Microbian Toxins and Serotherapy. J. W. Howard.
166 Urban Hygiene in Argentina. (Nuestra higiene urbana.) F. Otero.

July 25, No. 30, pp. 149-200

167 The Physician and the Parturient. (El medico y la partera.) J. A. Beruti.
168 Acute Appendicitis. E. F. Belaustegui.
169 *Leg Technic for Eliciting Babinski Toe Reflex. (Nueva manera de investigar el signo de Babinski.) A. Guemes.
170 Application of Mendel's Law in Heredity. (Consecuencias de la ley de Mendel. Interpretacion de Heider. Terminologia de Bates. Biometras y Mendelianos. La pangenesis de Darwin.) V. Delfino.

August 1, No. 31, pp. 201-252

171 *Automobile Fracture. (La fractura del radio en los automovilistas.) L. Bard.
172 Cesarean Section for Placenta Prævia. A. Zabala.
173 *Bilateral Anastomosis Between Vas Deferens and Testicle. M. Tamburini.

August 8, No. 32, pp. 253-300

174 Research on the Will Power. (La potencia volitiva, es medible?) V. M. Farré. Commenced in No. 28.
175 *Inguinal Hernia With Part of Caliber of Intestine Strangulated. (Hernia inguinal de Richter a forma peritoneo-vaginal.) D. del Valle.

162. **Goat Serum in Treatment of Lupus.**—Lagomarsino's patient was a farmer of 46 and the lupus was of three years' standing, involving the nose. No improvement had been derived from the usual measures and roentgenotherapy. He was then given a course of local treatment with goat serum, gauze wet in normal goat serum being applied twice a day and the parts washed out with the serum. Hard scars formed, and these eschars were curetted and the serum applications continued on the raw surface. This goat serum treatment had been found very useful by Lagomarsino in a number of previous cases of various affections of the nose and ears and for gastric and varicose ulcers. The lupus soon showed marked improvement and all trace of it had apparently disappeared in six weeks as shown by the photographs of the patient before and after. The improvement has persisted unmodified during the four months to date.

164. **Separation of the Epiphysis From the Shaft of the Humerus.**—Jorge's study of this subject is accompanied by sixteen illustrations showing the mechanism, results and treatment for separation of the upper epiphysis. In his experience this epiphysis is the one that is most liable to become separated. The outcome depends on whether there is displacement of the epiphysis, and on the treatment applied. If there is displacement, the arm should be immobilized in slight inward rotation in a plaster cast after reduction. If there is no displacement, an ordinary bandage and splint will do, with a cotton wedge-shaped pad in the axilla. One of the cases illustrated shows extreme atrophy and shortness of the arm after uncorrected separation of the upper epiphysis. The injury at the age of 4 had been supposed to be merely a dislocation, and treatment had been applied on this basis by several physicians without benefit. The boy at 14 had ankylosis of the shoulder and the arm was 9 cm. shorter than its mate. Roentgenoscopy is indispensable, and even the best reduction does not always prevent any arrest in the development of the bone after separation of its epiphysis, but the lack of proper correction is certain to entail serious consequences. Massage should be begun early, with passive exercise as early as the second fortnight.

169. **Leg Technic for the Babinski Sign.**—Guemes noticed that in certain cases of nervous disease when the patient, reclining on his back, lifted his leg for about a foot, the big toe contracted as in the Babinski plantar reflex and the other big toe also contracted simultaneously although the other leg was at rest. This phenomenon was found unilateral in a number of cases of hemiplegia and bilateral in paraplegia. The toe does not contract in either foot if the leg is passively lifted, and of course it does not occur if the paralysis is so deep that the patient is unable to raise his foot to 30 cm. The sign was never observed in persons free from organic nervous disease, but it was positive in the case of sclerosis in patches examined, in two hemiplegic patients, in a case of myxedema with slight paresis of the legs, and it was most pronounced in a case of infantile hemiplegia. The sign was negative in a case of hemiplegia of syphilitic origin and in an old spastic lumbar myelitis. The findings were negative also in five cases of tabes, two of epilepsy and one each of syringomyelia, polyneuritis and histero-epilepsy. Guemes discusses the mechanism and significance of the test thus modified.

171. **Automobile Fracture.**—Bard has encountered five cases in his hospital service and two in his private practice in which the radius was fractured in cranking the machine. In three the fracture was in the lower third from direct and in three from indirect violence, and in one case the styloid process had been fractured. In the latter case, under a compressive dressing and massage the lesion healed in two weeks. Some of the other fractures required reduction, massage and a cardboard splint; the cure was complete in all by the twentieth day at latest. These automobile fractures are thus seen to be comparatively harmless when properly treated at once.

173. **Anastomosis Between Vas and Testicle.**—Tamburini reports a case in which he connected the vas and testicle to remedy a bilateral destructive process from acute gonorrhea affecting the epididymis on each side. The result was a complete functional success.

175. **Hernia With Only Part of Caliber of Intestine Protruding.**—Del Valle discusses the mechanism of Richter's hernia involving the femoral, obturator or inguinal openings. The data presented show that the pouch with a congenital inguinal hernia may present a tendency to stricture at four points, the lowest at a partial septum between the sac proper and the tunica vaginalis, where a Richter hernia may develop. The symptoms when this occurs are liable to be misleading, but the strangulation here is particularly liable to entail gangrene, even as early as in twelve hours. In the typical case described, the congenital inguinal hernia, the sudden onset of pain and swelling of the scrotum without signs of inflammation, and the scanty stool and flatus suggested strangulation of the hernia, but at first this seemed disproved by finding the inguinal ring permeable for the finger, and the complete motility of the scrotal tumor. The uniform cylindroid shape of the spermatic cord, its length and the cystic contents of the scrotal portion all tended to locate the trouble, and the operation confirmed the assumption of a Richter hernia in the base of the scrotum. Although only twenty-four hours had elapsed, and the symptoms had not been threatening, yet the intestine already showed signs of marked necrosis, with a subserous hemorrhagic infarct and separation of the serosa.

Ugeskrift for Læger, Copenhagen

August 29, LXXIV, No. 35, pp. 1235-1264

176 Effectual Abortive Treatment of Gonorrhea. (500 Tilfælde af Abortivbehandling af Gonorré efter Engelbreths Metode.) C. Engelbreth.